SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII January, 1963 No. 1

Dish Garden of Succulents exhibited
1962 by Mrs. A. Holt

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor

Volume XVII JANUARY, 1963 No. 1

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Desert Botanical Garden of Arizona

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

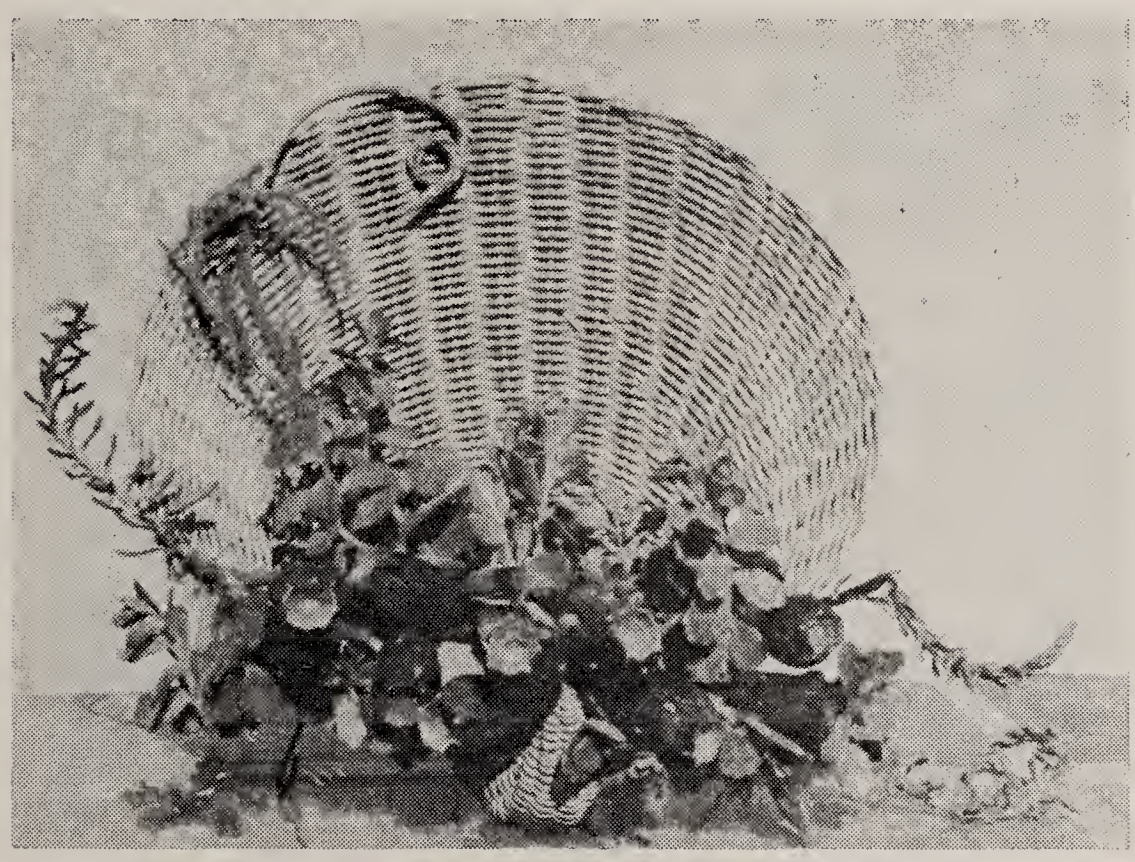
SIXTEENTH ANNUAL

CACTUS SHOW

FEBRUARY 17TH TO FEBRUARY 24TH, 1963

Sponsored by the Phoenix Gazette and the Desert Botanical Garden

Webster Auditorium
Papago Park,
Phoenix, Arizona
SHOW OPEN DAILY 9 A.M. TO 5 P.M. — ADMISSION FREE



Arrangement of Succulents against the wall
exhibited 1962 by Mrs. E. S. Tanner

CLASSIFICATIONS

SECTION I **CACTI**

Class A. **POTTED PLANTS**

Div. 1.	OPUNTIA	11.	ECHINOCACTUS
2.	CEREUS	12.	GYMNOCALYCIUM
3.	ECHINOCEREUS	13.	ASTROPHYTUM
4.	REBUTIA	14.	THELOCACTUS
5.	CHAMAECEREUS	15.	ECHINOMASTUS
6.	LOBIVIA	16.	CORYPHANTHA
7.	ECHINOPSIS	17.	MAMMILLARIA
8.	ARIOCARPUS	18.	EPIPHYLLUM
9.	STENOCACTUS	19.	ANY OTHER SPECIES
10.	FEROCACTUS	20.	SEEDLINGS

Class B. **CRESTED PLANTS**

Div. 1. Crested Cacti — own root

2. Crested Cacti — grafted

Class C. **MONSTROSE PLANTS**

Class D. **GRAFTED PLANTS**

Class E. **COLLECTIONS — 5 species of a genus**

SECTION II **SUCCULENTS OTHER THAN CACTI**

Class A. **POTTED PLANTS**

Div. 1.	AEONIUM	10.	HAWTHORIA
2.	AGAVE	11.	KALANCHOE
3.	ALOE	12.	LITHOPS
4.	BRYOPHYLLUM	13.	MESEMBRYANTHEMUM
5.	CRASSULA	14.	PLEIOSPILOS
6.	DUDLEYA	15.	SEDUM
7.	ECHEVERIA	16.	STAPELIA
8.	EUPHORBIA	17.	YUCCA
9.	GASTERIA	18.	ANY OTHER SPECIES

Class B. **COLLECTIONS** — 5 species of a genus

SECTION III **DESERT TREES & SHRUBS**

Div. 1. TREES

2. SHRUBS

3. DESERT BONSAI

4. ANY OTHER DESERT PLANTS

SECTION IV **ARRANGEMENTS**

Class A. **DISH GARDENS** (Planted) Accessories permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS

Class B. **CENTERPIECES** — Accessories permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS
4. NATURAL DRIED DESERT MATERIAL
5. MEXICAN INFLUENCE
6. AMERICAN INDIAN INFLUENCE
7. ANY OTHER CENTERPIECE

Class C. **ARRANGEMENTS ON/or AGAINST THE WALL**— Accessories Permitted

Div. 1. CACTI
2. OTHER SUCCULENTS
3. CACTI & OTHER SUCCULENTS
4. NATURAL, DRIED DESERT MATERIAL
5. MEXICAN INFLUENCE
6. AMERICAN INDIAN INFLUENCE
7. ANY OTHER ARRANGEMENT

Class D. **CORSAGES**

Div. 1. SUCCULENTS
2. DRIED DESERT MATERIALS

Class E. **BUTTON GARDENS**

Class F. **MINIATURE ARRANGEMENTS** — UNDER 5″

Class G. **SMALL ARRANGEMENTS** — 5″ TO 8″

Class H. **STRAWBERRY JARS** — Cacti and/or other succulents

SECTION V. **ARTS — DESERT SUBJECTS**

Class A. **BLACK & WHITE PHOTOGRAPHS**

Class B. **OIL PAINTING**

Class C. **WATER COLOR PAINTINGS**

Class D. **ANY OTHER MEDIUM**

Class E. **DESERT WOODS**
SECTION VI **EDUCATIONAL EXHIBITS**
SECTION VII **OPEN: NON-COMPETITIVE**

*Additional divisions will be set up when 3 or more species of a genus are entered.

The Sixteenth Annual Cactus Show will be held in the Webster Auditorium, Desert Botanical Garden, Feb. 17th-24th and is open to all persons interested in Succulent Plants, Arrangements, Photography (B&W or colored), Paintings, (desert plants or landscapes) or Desert Woods. No entry fee is charged.

All entries must be received not later than 5 P.M. Saturday, Feb. 16th.
Judging will be held Feb. 16th, 7-9 P.M.
Awards will consist of four large trophies for most points accumulated in each of the four large sections; smaller trophies for outstanding exhibits in the various classes; ribbons for 1st (blue), 2nd (red), 3rd (yellow), honorable mention (white) if merited.
Exhibits can only be removed after 5 P.M. Sunday, Feb. 24th.

Scale of Points is as follows:

CACTI & SUCCULENT SPECIMEN PLANTS	
Condition	45
Nomenclature	15
Rarity	10
Size or degree of maturity	10
Staging	20
	100

ARRANGEMENTS	
Design	25
Color	20
Relationship	15
Originality	15
Distinction	15
Condition	10
	100

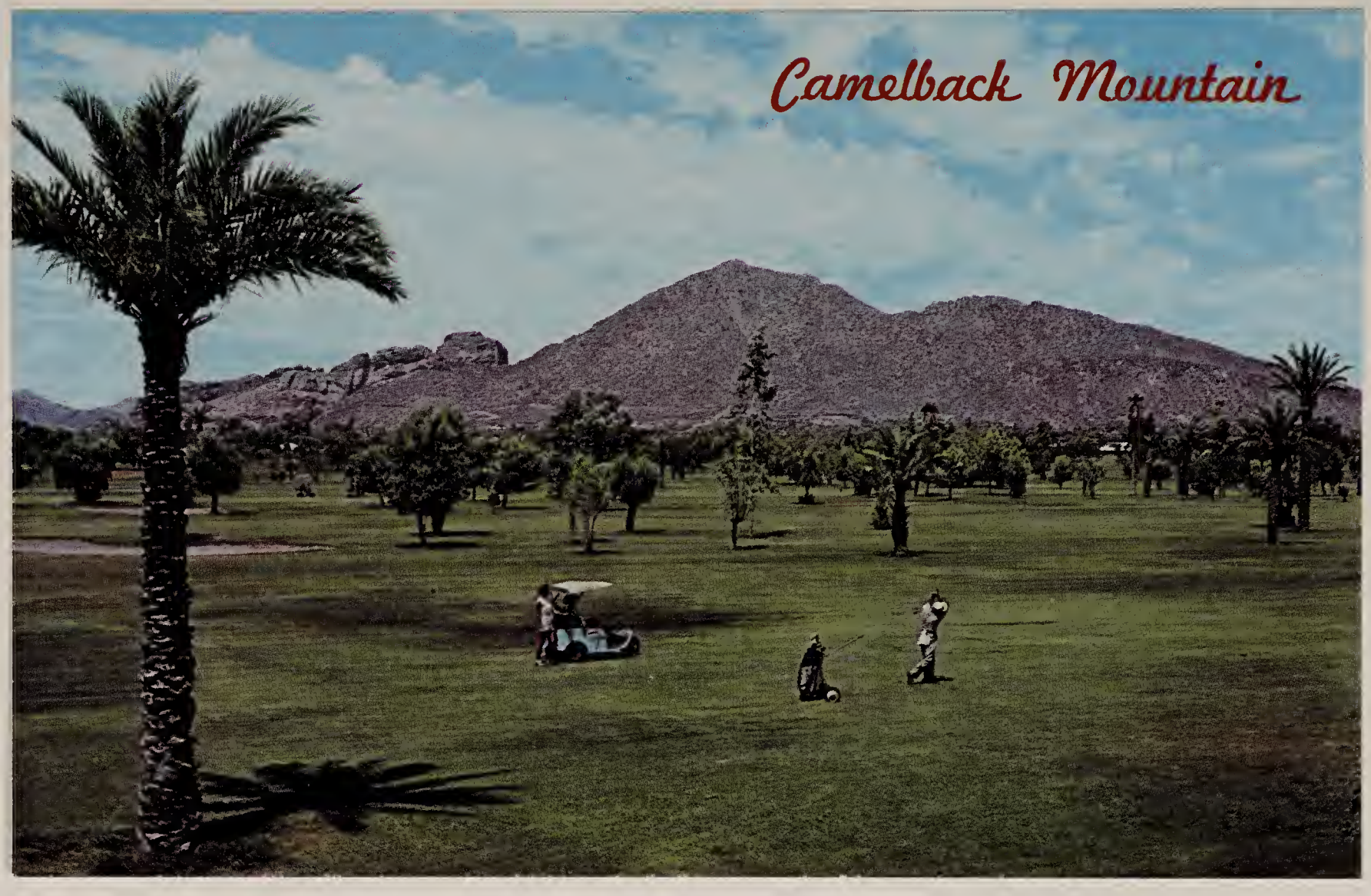
MINIATURES	
Scale	40
Design	30
Color Harmony	20
Condition	10
	100

CORSAGES	
Technique	15
Design	25
Color	15
Suitable combination of material	15
Distinction	20
Condition	10
	100

The "Handbook for Flower Shows" published by the National Council of State Garden Clubs, Inc., will be used as the basis of exhibiting, point scoring and judging of all Arrangements, Dish Gardens, Miniatures, etc. The Standard System of Judging will be used.

The decision of the National Accredited Judges will be final.

ARIZONA POINT OF INTEREST



CAMELBACK MOUNTAIN, whose outline resembles a kneeling camel, is located in northeastern portion of Phoenix. Many winter resorts, estates and beautiful homes surround it and extend into Scottsdale and Paradise Valley. The mountain, elevation 2700 feet, is composed of granite, cretaceous conglomerate and archosic sandstone.

Continuation, from the December issue, of the Garden's present roster. Each year indicates when the members began to support the Garden.

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Wills, C. Mack, P. O. Box 3714, Honolulu, Hawaii

GARDEN ACTIVITIES FOR JANUARY

3rd 3 P.M.—Lecture—"Arizona Cacti in Bloom"
8th 8 P.M.—CACTOMANIACS meetinng
9th 3 P.M.—Class, "Deserts and their Plants"
10th 11 A.M.—Y. W. C. A. lecture, "Deserts" (there)
3 P.M.—Lecture, "Arizona Wildflowers"
8 P.M.—Desert Crest, lecture, "Wildflowers" (there)
16th 3 P.M.—Class, "Desert Succulent Plants"
17th 3 P.M.—Lecture, "Arizona Trees and Shrubs"
23rd 3 P.M.—Class, "Culture of Succulent Puants"
24th 2 P.M.—Senior Citizens Safari, Phoenix City Park Dept.
3 P.M.—Lecture, "Arizona Birds and Animals"
30th 3 P.M.—Class, "Identification of Desert Trees"
31st 3 P.M.—Lecture, "Arizona Scenics"

FEBRUARY

5th 8 P.M.—CACTOMANIACS meeting
6th 10 A.M.—Phoenix Country Day School, lecture (there)
3 P.M.—Class, "Culture of Desert Trees and Shrubs"
7th 3 P.M.—Lecture, "Succulents other than Cacti"
13th 9:30 A.M.—Class, all-day desert field trip
16th 5 P.M.—Deadline for Cactus Show entries
17th to 24th 9 A.M. - 5 P.M.—Sixteenth Annual Cactus Show
28th 3 P.M.—Lecture, "Arizona Cacti"

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

VOL. XVII February, 1963 No. 2

Dish Garden of Cacti and other Succulents exhibited 1962 by Mrs. Richard F. Williams

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVII | February, 1963 | No. 2

Arizona Cactus and Native Flora Society

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Desert Botanical Garden of Arizona

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

NOTES FROM THE CORNER OF THE EDITOR'S DESK

The format of the SAGUAROLAND BULLETIN will have several changes this year that will be of interest each month to our members and readers.

1. Pertinent articles will be presented each month. Whittman Evans, local cactus collector and exporter for the past thirty years, has a timely story on "Saguaro Cactus Doomesday?"

2. The Garden has been growing many trees and shrubs from seed collected in Mexico by our staff and members during the past ten years. John Weber will have a summary of our findings of a different plant each month. A report of TABACHIN (Red Bird of Paradise bush) is on pages 20 and 21.

3. A different desert wildflower, with photos, will be described each month by your Editor.

4. Each issue will again carry a colored postcard. This year the cards will illustrate a well known mountain of Arizona with a short description.

5. Reviews of new books will continue as books are published. A preview of "Cacti of the Southwest," authored by your Editor, is shown on pages 22 and 23. Release of this book will be about February 15th.

16TH ANNUAL CACTUS SHOW

Webster Auditorium, in the Garden, will again house the Annual Cactus Show co-sponsored by the Phoenix-Gazette newspaper and the Garden. The newspaper's support over the past fourteen years has helped to make the Show a greater attraction each successive year. Anticipated attendance this year will be about 17,000 visitors.

The Show Committee of John Hales, Rod McGill, Warner Dodd, John Weber, Mrs. C. Fuhrer and Mrs. R. I. Turner have met several times and arranged for a few changes in the classification list which was printed in the January issue. Another copy is inserted in this issue for Arizona members and exhibitors.

Judging will consist of a panel of three members who will judge the specimen plants and another panel of three to judge the arrangements. Individual judges will be assigned to the Paintings, Photographs and Desert Woods.

Points for the various classifications will be based on the prevailing practices of the Cactus and/or Flower Shows. The Standard System of Judging will be used by National Accredited Judges.

Awards will be as follows: Four sweepstake trophies will be given for the accumulation of largest number of points in each of the four sections of the Show. Fourteen individual trophies will be awarded for the various classes. Blue, Red, Yellow and White ribbon awards will also be given for the winners in the different divisions.

The Classification list has been mailed to all of the Garden Club Presidents in the State and to many other inquiries. Interest appears to be quite good despite the loss of many plants due to the freeze. We are certainly looking forward to another great show.

Many Volunteers will be needed to expedite another smooth operating show. If you have a day or two in which you would like the experience of meeting our many visitors please phone BR 5-5592 and let us know the days on which you wish to volunteer your time. Hot lunches will again be served to all volunteers.

SEE YOU AND YOUR ENTRIES AT THE SHOW!

SAGUARO CACTUS DOOMSDAY?

By J. Whitman Evans, Phoenix

Dr. Stanley Alcorn, plant pathologist with the U. S. Department of Agriculture, has predicted extinction of the Saguaro cactus forest in the Saguaro National Monument, by 2000 A.D.

His reasons for this prediction include: bacterial disease, insect infestation, and destruction of young plants by rodents, all contributing to a declining rate of seedlings to replace the old plants.

I would rather look at the optimistic side, and take exception to Dr. Alcorn's views, because of factors he did not take into consideration. But at the same time, I would not be too complacent; measures should be taken to aid preservation and assure reforestration at a sufficient rate. This should be thoroughly studied by the National Park Service, which has jurisdiction over the matter.

Bacterial disease is one of Nature's ways of preventing overpopulation. Rarely is it so virulent as to be totally destructive, and this will occur only when too many other adverse conditions obtain. Fortunately, a large percentage of Saguaros is more or less immune to these various strains of bacteria. Many plants are never infected, and even many of those so affected, will continue to grow and reproduce to a certain extent, for many years. We can always observe a certain percentage of very old plants dying from these causes, even in the healthiest stands. During times of drought, such as now, the plants' resistance can be lowered, too.

The Saguaro Moth is a serious problem, but here again, only a comparatively small percentage of plants is seriously affected. Many infested plants will live out an almost normal life span. During times of drought, this damage is of much greater consequence, and should cause great concern. This problem might be remedied by finding, and encouraging, the natural enemies of

A Saguaro slowly dying due to rot caused by larvae of a moth

these moths. Moth traps can be cheaply constructed by placing lights above kerosene-filled basins, and these traps do not have to be particularly numerous, since the moths are attracted from a considerable distance. One drawback to these traps would be destruction of beneficial insects as well, so the problem would have to be approached with caution.

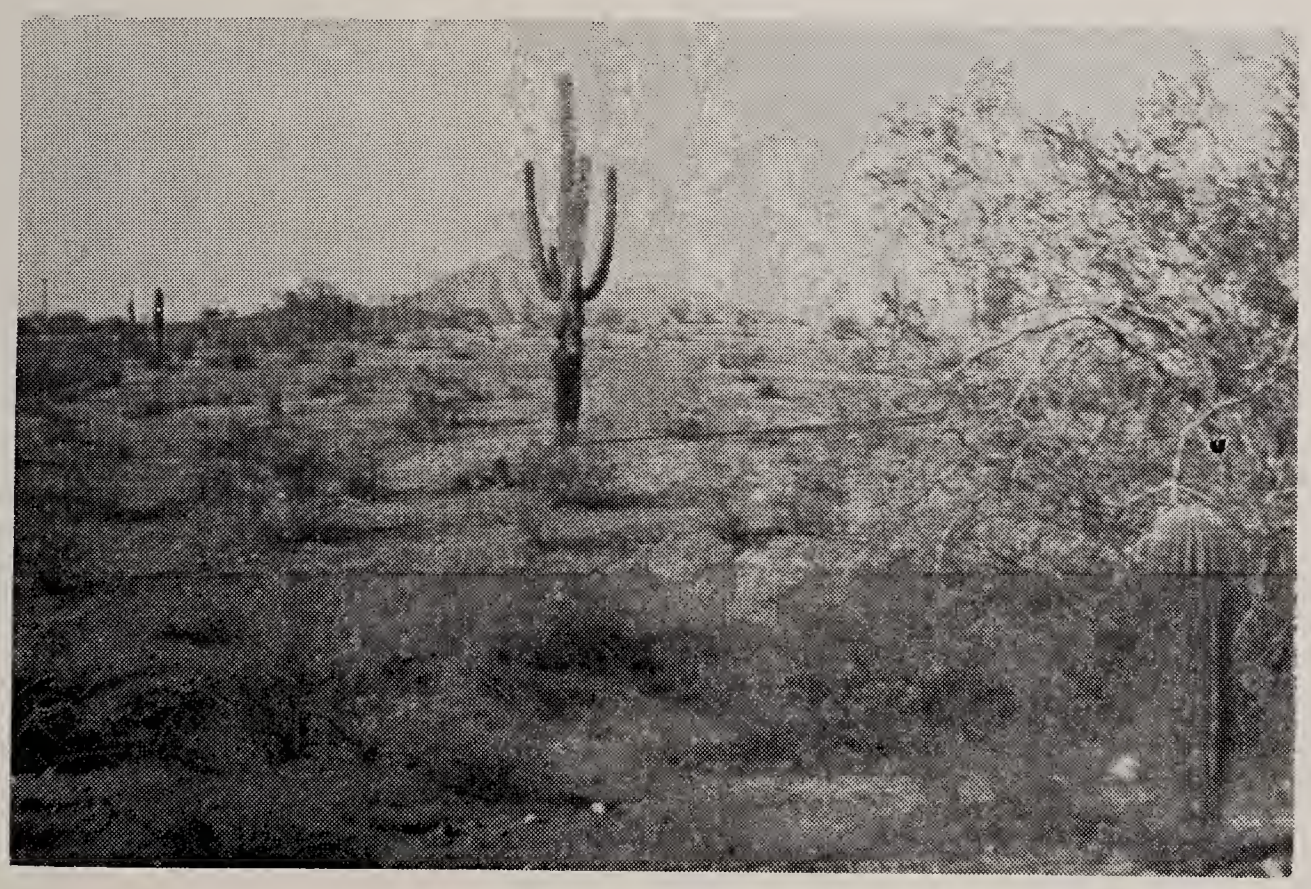
Dr. Alcorn notes that during attempts at reforestration, young transplanted seedling plants were promptly eaten or seriously damaged by rodents. Even wire protective cages built around the plants were ineffective, since the rodents

tunneled under and up to the plants. This sudden appearance of food is irresistable to a hungry and thirsty rodent. This problem can be met with by completely enclosing the plant, roots and all, in a sphere of wire, before planting. This will not hamper development of roots. A better and more effective way to control the rodents, would be to encourage their natural enemies, the coyotes, foxes, owls, hawks and other creatures who dine on rodents. Transplants could be larger, and brought in during times of plenty, when there is enough natural herbage to support the rodents.

Most of the natural reforestation occurs in years of good rainfall, when there is a series of good rains to germinate the seeds and nurse the seedlings through the first few months. This is also the time when the Saguaro seedling is reasonably safe from rodents and chewing insects, because there is plenty of other food. The Saguaro is bitter and acid, and eaten only as a last resort.

Not too far from the Monument may be found areas where the Saguaro is on the increase, or holding its own very nicely. One of these areas is in the Quijotoa range, below Casa Grande. Here may be found hundreds of young Saguaros, most of them quite healthy. Here, too, Nature's balance is pretty much in evidence; there are still plenty of coyotes, foxes, owls and hawks, etc. This is a wonderfully beautiful wilderness area, due to its being within the Papago Indian Reservation, where White hunters and commercial cactus collectors may not commit their usual depredations. Here, too, the Saguaros are far enough from the centers of population that White Man and White Child (sometimes very idiotic) do not do much damage to the plants. Perhaps the National Parks Service can learn much from this area.

I certainly do not believe that the Saguaro will be extinct in the Monument in 37 short years. But I am worried just enough by the implication Dr. Alcorn's conclusions to feel that something should be done to assure an upsurge in the young Saguaro population. All of us who love Arizona and the stately Saguaro, one of God's noblest creations, hope that the necessary measures to assure reforestration, will be taken.



Infected Saguaro on caliche soil in the Garden. Many young Saguaros are visible; recovery is quite balanced in our fenced areas.

VERBESINA ENCELIOIDES var. EXAURICULATA COMPOSITAE

CROWN BEARD

Sunflower Family

A one to four foot tall annual having canescent (cane-like) branches bearing many yellow, rayed flowers and blooming from May to November. Grows from southern California through northern Mexico and east to Texas and north to Montana. CROWNBEARD will also bloom through the winter months in the lower Salt and the Gila River valleys of Arizona.

The rounded, flower heads are filled with many seeds that are relished by the birds.

These annuals will give homes of southern Arizona splashes of winter color and are easily cultivated. The seeds are not available in any of the stores so you have to gather them yourself in the desert. Seeds should be planted in the early fall, kept moist, given some protection from birds and rodents. They are fast growing plants and will bloom through the winter if not frosted.

Close-up of Crown-beard flower and bud

Verbesina encelioides var. exauriculata 20″ annual blooming in January

Anil del Muerto (**Verbesina encelioides**) has been used by the Indians for rheumatism, swellings, sores, skin diseases, liver trouble and to relieve the pain of spider bites.

References:

Arizona Flora—Kearney & Peebles.

Flowering Plants of California—W. L. Jepson.

Healing Herbs of the Upper Rio Grande—L. S. M. Curtin.

ARIZONA POINT OF INTEREST

BARNES BUTTES are an eastern landmark of Phoenix in the Papago Park. The Garden relinquished this western acreage to the Arizona Land Dept. in 1957 who in turn processed it to the City of Phoenix Park Dept. for recreation use. The buttes were named in 1937 by the Forestry Service in honor of Will C. Barnes who was a soldier, stockman, legislator, forester and author of "Arizona Place Names"—1937. The buttes are of conglomerate granite with an elevation of 1663′.

CAESALPINIA PULCHERRIMA Family LEGUMINOSAE
BARBADOS-PRIDE: BIRD-OF-PARADISE: TABACHIN

By John H. Weber

Three year old, 4′-6″ shrub in flower

DESCRIPTION:

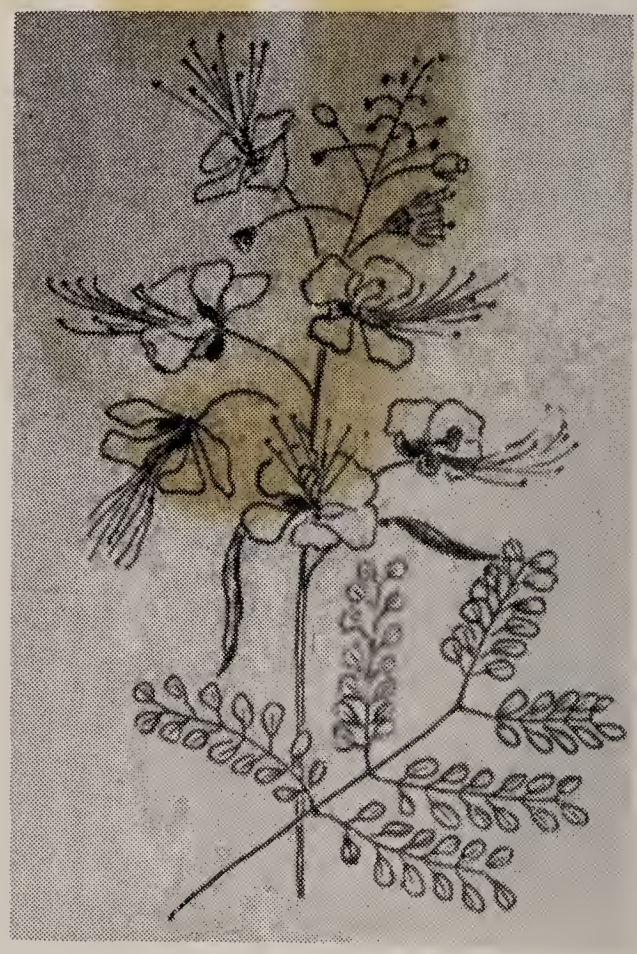
CAESALPINA PULCHERRIMA takes the form of a spreading bushy shrub or small tree. It is deciduous in cold regions and during periods of drought. Rapid growth occurs from a woody base after summer rains begin. The thin bark is brown shading to red on the terminal shoots which are unarmed or armed with fleshy prickles. In size the plant ranges from three to fifteen feet in height with a trunk up to four inches in diameter. The delicate leaves are bipinnate and bear from 12 to 18 pinnae; these being oblong to obovate in shape and measure less than one inch in length. There is an extended flowering period from summer to fall. The flower is large and red in color variegated with yellow or wholly yellow; the inflorescence being located on the new growth. Stamens and style are red and long exerted. Seed pods measure about four inches in length and less than one inch in width.

DISTRIBUTION:

The TABACHIN is widely cultivated in Mexico and throughout Central America as well. It is growing in a wild state in the central foothills of Sonora at Batacosa, Tesopaco, Los Tanques, Guasaremos, San Bernardo, Alamos, and other sites. The plant usually grows on outwash plains or slopes in rocky or coarse soils. Other known occurrences are Cuba, Puerto Rico, Santa Domingo, and the Philippine Islands.

UTILIZATION:

The Red Bird of Paradise is used primarily as a flowering shrub. It is particularly desirable from the standpoint of its late summer flowering period



Line-drawing of flowers and leaves

Pods and fruit, natural size

when there are so few other shrubs in bloom. Employed singly or in groups it produces a mass of color and serves also to attract hummingbirds. In colder regions it could be installed in a container and moved indoors with the advent of freezing temperatures.

CULTURE:

The TABACHIN is quite frost tender, freezing back to ground level when temperatures fall below 30°F. The plant quickly recovers in the spring to flower again the following summer. A protected site, one with well drained soil, should be selected for plant installation and deep irrigation should be applied weekly after new growth commences. Top mulching with barnyard manure will promote rapid growth.

PROPAGATION:

Species of CAESALPINIA are easily propagated from seed. The seed has an impermeable coat, rendering necessary scarification in order for water to penetrate and result in germination. Best results are derived by starting seedlings in containers and allowing one year's growth before planting direct in the ground.

REMARKS:

TABACHIN has many beneficial uses. It has served as a source of tannin, dye, ink, medicine, and food. In Arizona and California it is utilized as an ornamental and is grown on a commercial scale.

REFERENCES:

L. H. Bailey—The Standard Cyclopedia of Horticulture.

Forrest Shreve—Vegetation of the Sonoran Desert.

Paul C. Standley—Trees and Shrubs of Mexico.

When you visit the Show this month, compare our staging with that of the above 1952 Show

(Preview of pages 5 and 25 from CACTI OF THE SOUTHWEST to be released about February 15th.)

PREFACE

As the popularity and interest in Cacti becomes greater each year, there is the need of books that will appeal to the layman yet are of benefit to the student and botanist.

The Southwest is experiencing a population boom and many of our new citizens and visitors are seeking information on the identity and growing of our unique cactus plants.

It is hoped that this book will answer these many inquiries with its keyes, common names, photographs and culture. If additional assistance is needed, visit or write the Desert Botanical Garden. Its large library on succulent plants is available to all for reference work.

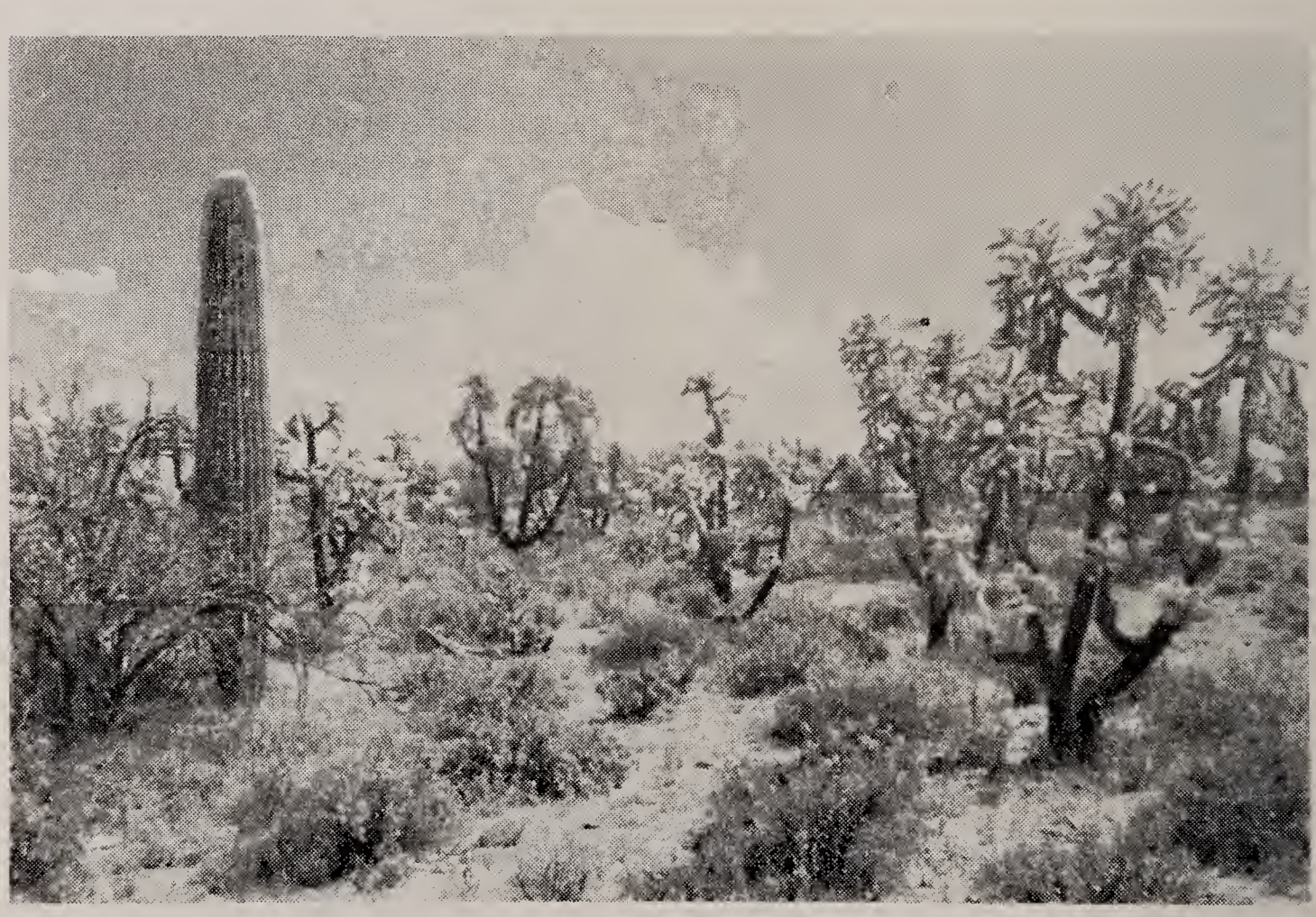


Fig. 2. Chain–fruit Cholla *(Cylindropuntia fulgida)* and Saguaro *(Carnegiea gigantea)* forming dense thickets 25 miles north of Tucson in the Sonoran Desert.

9. *CYLINDROPUNTIA FULGIDA* (Eng.) Knuth
Opuntia fulgida Engel. 1856

A tree-shaped cholla which forms dense impregnable stands, practically excluding all other forms of cacti. Plant sometimes reaches 12' or more with a very woody trunk 4" to 7" in diameter, much branched, sometimes completely from the base, and forms a compact flattened crown; terminal joints 4" to 8" long, cylindrical, 1" to 2" in diameter, quite succulent, strongly tuberclate, breaking off quite readily on contact with animals or persons; spines 2 to 12, yellowish at each areole, ¾" to 1½" long, yellow to brown, needle-like, strongly barbed and covered with straw - colored, papery sheaths; glochids small, whitish to light yellow; flowers light rose or streaked with lavender, 1" to 1¼" in diameter; fruit green, first year slightly tuberculate then tending to smoothness in age, ¾" to 2" long, juicy, proliferous; seeds small, 1/8" in diameter, wanting.

The 'chains of fruit' are formed by blossoms coming out of the persistent fruit of the previous year and forming additional fruit that year. This method is continued from year to year until the chains of fruit will, in some cases, touch the ground. A person can count the number of years that the fruit have proliferated by counting the fruits on one segment of the cluster.

The barbed spines attach themselves into any passing soft object causing a section or stem of the plant to be transported to another area and in falling to the ground, the segment will root.

Propagation from seed is quite difficult. It is easier to place the stems or fruit on the ground, where they will root readily.

Heavy stands of this cholla can be seen from the highway between Florence, Ariz. and Oracle Junction. East of Florence, large plants, that died many years ago, are gathered by manufacturers who turn them into novelty items.

TYPE LOCALITY — Western Sonora, Mexico.

DISTRIBUTION — Southern Arizona, western Sonora.

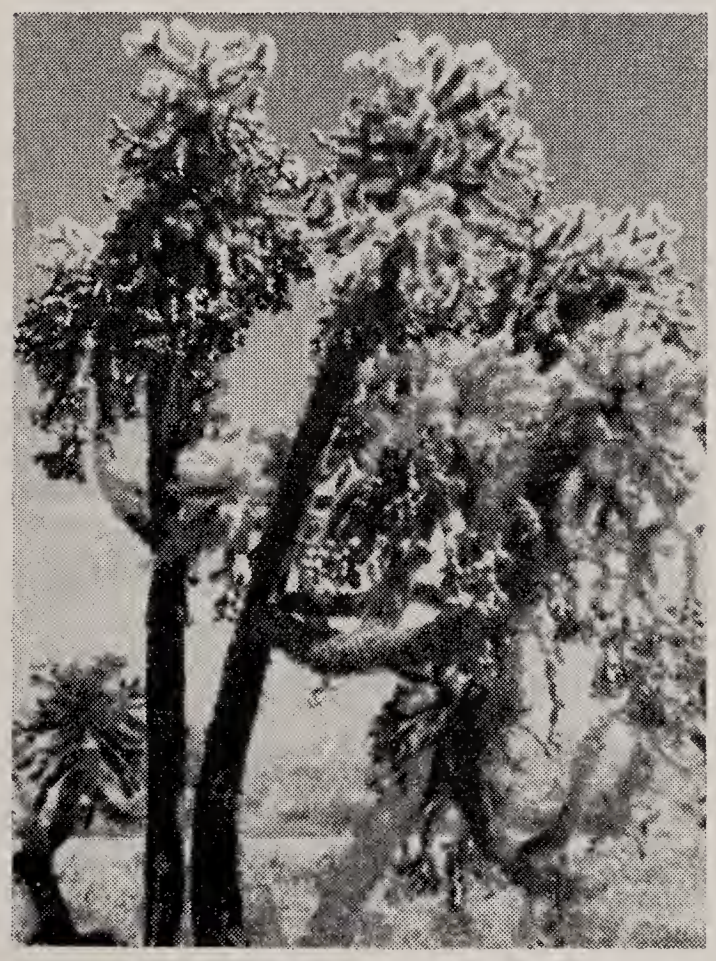


Fig. 13. *Cylindropuntia fulgida,* an 8' plant bearing numerous chains of fruits.

AN UNUSUAL GEMINI FRUIT

Fruit of *Eriocereus martinii* (Night-blooming climbing Cereus) producing another fruit from its fruit areole at the home of members, Mr. and Mrs. Roscoe Willson, Phoenix authors of early Arizona activities. Sorry to relate, but birds destroyed the fruit before it could be dissected.

GARDEN ACTIVITIES FOR FEBRUARY

5th 8 P.M.—CACTOMANIACS meeting
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17th to 24th 9 A.M. - 5 P.M.—Sixteenth Annual Cactus Show
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SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII March, 1963 No. 3

Trophy winner for best Succulent Arrangement exhibited by Mrs. Marta Carpenter

REG MANNING

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CACTI of the SOUTHWEST

W. Hubert Earle
Director

Desert Botanical Garden of Arizona
Science Bulletin #4

112 pages, 1 map, 1 line-drawing, 129 B & W photographs.

A guide to 121 Cacti and several varieties found between the Sierra Nevada Mountains and the Rio Grande River in the states of Arizona, eastern California, southern Nevada, southern Utah, southern Colorado and western New Mexico with text and photographs to aid the layman, student and botanist.

Introduction to Cacti (4 pages) describes the Origin, Distribution, Structure, Areoles, Spines, Flowers, Fruit and the Classification of Cacti. Also included (11 pages) is the Culture of Cacti, State Plant Laws, Glossary of Cacti Terms, Book Index and an Index of Common Cacti names.

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REPORT OF THE 16th ANNUAL CACTUS SHOW

The 16th Annual Cactus Show can go on record as another exciting eight day Show due to the following: a. The best staged Show to date with excellent exhibits and the new lighting system added to better viewing of the plants; b. Early part of the show CACTI OF THE SOUTHWEST, authored by your editor, was released, published by the Garden, and included in this Bulletin is a "release announcement"; c. Latter part of the show, CACTI, WILDFLOWERS and DESERT PLANTS OF ARIZONA, copy written by your editor, published in color by the Arizona Development Board, was released. A copy of this sixteen page booklet will be included with the April issue of the Bulletin.

ATTENDANCE was 13,229 or several thousand more than last year. Weather was best in years—sunshine every day and shirtsleeves were in evidence. As the City of Phoenix expands and booms, more activities of many types are arising, thus creating more competition for our Show. This then causes us to keep our Show on a high interest level.

PUBLICITY prior and during the Show was excellent due to the work of Dick Jones, Promotional Dept., of the co-sponsors, the Phoenix-Gazette. Other newspapers, radios and TV's in the Valley also gave us good coverage which was greatly appreciated.

Sixty-seven EXHIBITORS, an increase of 10% over 1962, showed 486 exhibits. We were afraid that the January freeze would greatly decrease the exhibits but to our surprise our members 'came-thru' with very good material.

We had three enthusiastic panels of JUDGES who began judging at 7 p.m. and were completed by 9:30. Judges in the following categories were: **Specimen Cacti and Succulents Plants**—R. C. Proctor, Herbert Bool and Whittman Evans. **Dish Gardens and Arrangements**—Mrs. C. Fuhrer, Mrs. A. F. Browne and Miss Betty Schimick, all National Garden Club accredited Judges. **Paintings**—Salvatore Macri. **Black and White or Color Photographs**—R. C. Proctor, Salvatore Macri and your editor. We greatly appreciate these folks devoting a Saturday evening judging the fine exhibits in the Auditorium and the overflow in the Visitor's Reception Building.

Three meetings, months prior to the Show, were held by the SHOW COMMITTEE who did a fine job to expedite the Show. These behind the scenes unsung workers deserve a great amount of credit that enabled the Show to be another success. They were: John Hales, Rod McGill, Warner Dodd, Mrs. A. Holt, Mrs. Lela Turner and typists Mrs. Thelma McDougall and Mrs. June McGill.

Fifty-nine VOLUNTEERS gave of their time to act as hosts, hostesses, guards, clerks, informationists, parking lot attendants and many incidental chores and did an excellent job that would have been impossible for our small staff.

As in the past years, Hiram Pratt was on duty daily and his wife Maribel would have done likewise except for a cold. All of the following volunteers gave

a day to three days of their time: Mrs. Una Miller, Warner Dodd, Mrs. Daves Rossell, Mr. and Mrs. Charles Mieg, Mr. and Mrs. Bert Jinneman, John Hales, Mr. and Mrs. Rod McGill and children Lyle, Larry and Robin, Mrs. Helen Friedrichs, Mrs. Ruth Garland, Mrs. Ray Ashley, Mrs. Arthur Holt, Mr. and Mrs. L. S. Wakefield, Mrs. Edith Carroll, Mr. and Mrs. Clifford Schroeder, Dr. Lake Gill, Mr. and Mrs. George Lamb, Mr. and Mrs. W. G. Cook, Mr. and Mrs. Paul Willemsen, Dr. and Mrs. Gordon Matheson, Mrs. J. C. McDougall, Mr. and Mrs. Paul Neuman, Mrs. Liscum Diven, Mrs. L. V. Matson, Mr. and Mrs. Dugan Lewis, Ed. Stocks, Mr. and Mrs. G. H. Lindberg, Mr. and Mrs. J. Owen Stradling, Mr. and Mrs. Salvatore Macri, Mrs. Lela Turner, Mrs. Harry S. Cellner, Warren A. Donaldson, Demetrios Vlachos, S. M. Dohanian, Miss Virginia Fraser, Mr. and Mrs. Dale Pollock, Bernard Lewin, Miss Minnie Gentry, Miles Zoller, Mrs. Faith Haft, Miss Ludwika Liczbinska, Mrs. Max Connolly, and C. A. Arthur.

We greatly appreciate the work of all of the above members and know that they, too, extend their thanks to Mrs. Lois Earle for the 169 hot lunches she served during the week at noon-time. Also, our Staff members deserve commendation for working continuously for two weeks without a break.

An interesting aspect of the Show was that plants donated for resale by Mrs. Roy C. Cooper, Mrs. Lela Turner, Ed Stocks and Clifford Schroeder and sold by Warner Dodd on Saturday and Sunday yielded a return to the Garden of $103.95. The total revenue for the Show week was $4,375.05 which is the highest for any Show.

SWEEPSTAKES AND TROPHY AWARDS

SWEEPSTAKES WINNERS:

Cacti: Rodrick McGill, Rt. 1, Box 844, Glendale, Arizona.

OTHER THAN CACTI

Succulents: J. Owen Stradling, 126 S. Drew, Mesa, Arizona.

Arrangements: Mrs. E. S. Tanner, 2250 N. 17th Ave., Phoenix, Arizona

Art: Mr. Wm. A. Manderfield, 8334 E. Devonshire, Scottsdale, Arizona.

Photography: Miss Agnes M. Holst, 1902 E. Milletta, Phoenix, Arizona.

TROPHIES:

Cactus: Rod McGill.

Succulent: Mrs. Hiram Pratt, 5416 E. Avalon Dr., Phoenix, Arizona.

Dish Garden: Clifford Schroeder, 2126 Ventura Dr., Tempe, Arizona.

Centerpiece: Mrs. Lela Turner, 324 W. Siesta Way, Phoenix, Arizona.

Arrangement Against The Wall: Mrs. Marta Carpenter, 1802 N. Laurel Ave., Phoenix, Arizona.

Oil Painting: Mrs. Warren Rice, 519 Broadmor Dr., Tempe, Arizona.

Best Photo, Black & White: Agnes Holst.

Best Photo Color: Herbert F. Diegel, 2829 E. Fillmore, Phoenix, Arizona.

Best Educational Exhibit: John B. Hales, 1641 E. Willetta, Phoenix, Ariznoa.

Best Junior Exhibit: Michael Dankoski, 5902 E. Lewis Ave., Scottsdale, Arizona.

Best Desert Tree: Brooks Darlington, 6248 E. Palo Verde, Scottsdale, Arizona.

Best Open Non-Competitive Exhibit: Herbert Bool, 2735 E. Camelback, Phoenix, Arizona.

A portion of the 1963 Show with 'Dish Gardens' in the foreground and 'Arrangements Against the Wall' to the left.

A section of the Show showing the specimen Succulent Plants.

ARIZONA POINT OF INTEREST

FOUR PEAKS, about 45 miles east of Phoenix, is the southern end of the Mazatzal Mountains. These peaks rise up to 7691′ and are sometimes covered with snow in the winter. The north end of Roosevelt Lake is directly behind these peaks. In the foreground can be seen Hedeghogs, Chollas, Prickly Pears, Ocotillo and a Saguaro. This area abounds with wildflowers in the spring.

RIBBON AWARDS

CACTI—POTTED PLANTS

Opuntia: 1st, Rodrick McGill, Rt. 1, Box 844, Glendale, Arizona; 2nd & 3rd: Clifford Schroeder, 2126 Ventura Dr., Tempe, Arizona; 4th: Anne Van Drieberg, 4916 N. Woodmere Fairway, Scottsdale, Arizona.

Cereus: 1st: J. Owen Stradling, 126 S. Drew, Mesa, Arizona; 2nd and 3rd: Brooks Darlington, 6248 E. Palo Verde, Scottsdale, Arizona.

Echinocereus: 1st, 2nd, 3rd and 4th: Rod McGill, Glendale.

Chamaecereus: 1st: J. Owen Stradlnig, Mesa.

Lobivia: 1st: Brooks Darlington, Scottsdale.

Echinopsis: 1st: Lillian Lugibihl, 811 W. Howe, Tempe, Arizona; 2nd: Lloydene Dodd, 6426 W. Osborn Rd., Phoenix, Arizona; 3rd: Laura Nixon, 1541 E. Willetta, Phoenix, Arizona.

Ariocarpus: 1st, 2nd, 3rd and 4th: Rod McGill.

Stenocactus: 1st, 2nd and 3rd: Rod McGill.

Ferocactus: 1st and 2nd: Rod McGill; 3rd: Ed Stocks, 812 Lemon St., Tempe, Arizona.

Echinocactus: 1st and 2nd: Rod McGill; 3rd: C. A. Arthur, 6804 N. 27th Ave., Phoenix, Arizona.

Gymnocalycium: 1st, 2nd and 3rd: Rod McGill

Astrophytum: 1st, 2nd and 3rd: Rod McGill; 4th: J. Owen Stradling, Mesa.

Thelocactus: 1st: John B. Hales, 1641 E. Willetta, Phoenix, Arizona; 2nd, 3rd and 4th: Rod McGill.

Echinomastus: 1st: C. A. Arthur; 2nd: Laura Nixon.

Coryphantha: 1st: Rod McGill; 2nd: John B. Hales; 3rd and 4th Rod McGill.

Mammillaria: 1st: Rod McGill; 2nd and 3rd: John B. Hales; 4th J. Owen Stradling.

Epiphyllum: 1st: Barbara Ann Ross, 3417 N. 21st Dr., Phoenix, Arizona.

Succulent Arrangement against the wall by Mrs. Glenn Hodson

Any Other Species: 1st: Rod McGill; 2nd: John B. Hales; 3rd: Donald Bauer, 4620 N. 38th Dr., Phoenix, Arizona; 4th: Brooks Darlington.

Seedlings: 1st: Mrs. Helen Friedrichs, Wondervu, Colorado; 2nd: Bert Jinneman, 2910 N. 61st Dr., Phoenix, Arizona.

Neolloydia: 1st, 2nd and 3rd: Rod McGill.

Notocactus: 1st and 2nd: Rod McGill; 3rd: Brooks Darlington.

Epithelantha: 1st and 2nd Rod McGill; 3rd: J. Owen Stradling.

Crested Cacti—Own Root: 1st: Rod McGill; 2nd: John B. Hales; 3rd: J. Owen Stradling.

Crested Cacti—Grafted: 1st and 2nd: John B. Hales.

Monstrose Plants: 1st: John B. Hales.

Grafted Plants: 1st: John B. Hales; 2nd: J. Owen Stradling.

Collections: 5 species of a genus: 1st: J. Owen Stradling; 2nd: Ed Stocks.

SUCCULENTS OTHER THAN CACTI POTTED PLANTS

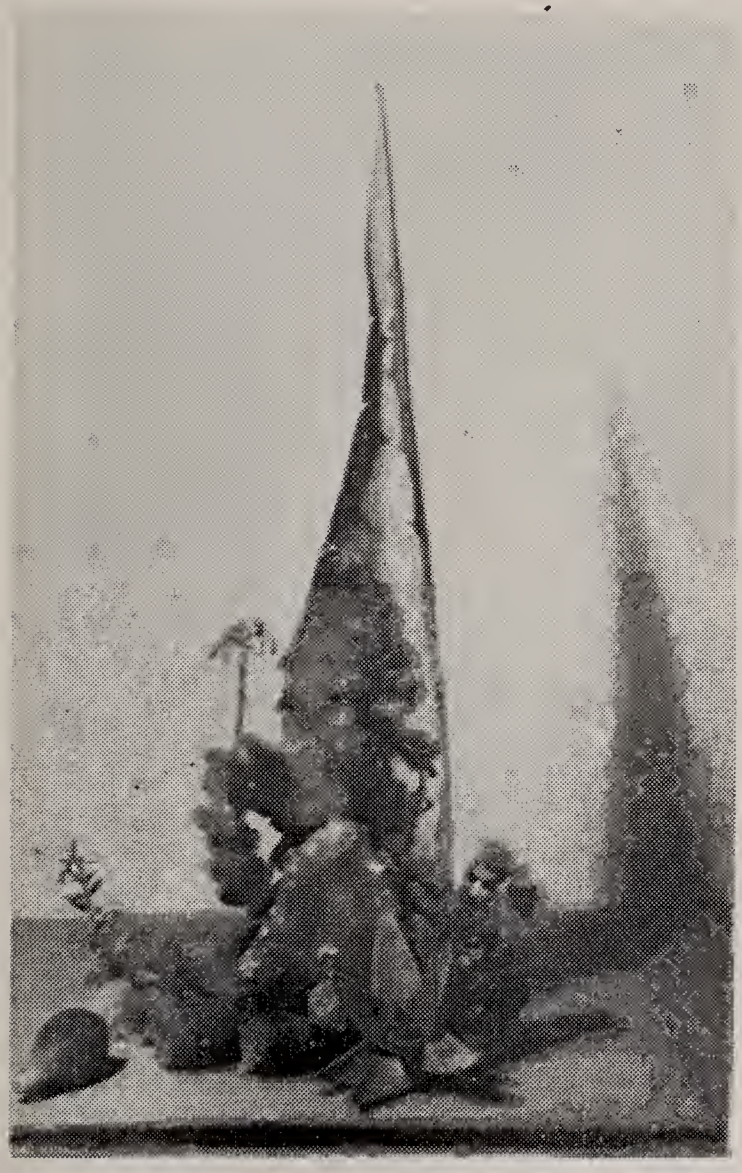
Aeonium: 1st: J. Owen Stradling, 126 S. Drew, Mesa, Arizona; 2nd: Mrs. Arthur Holt, 4648 E. Palm Lane, Phoenix; 3rd: Edith Carroll, 433 E. Malibu, Tempe, Arizona.

Agave: 1st: Mrs. Arthur Holt; 2nd: Ed Stocks, 812 Lemon St., Tempe, Arizona; 3rd: Clifford Schroeder, 2126 Ventura Dr., Tempe, Arizona.

Aloe: 1st: John B. Hales, 1641 E. Willetta, Phoenix, Arizona; 2nd and 3rd: J. Owen Stradling; 4th: Ed Stocks.

Crassula: 1st, 2nd and 3rd: J. Owen Stradling.

Dudleya: 1st, 2nd and 3rd: Mrs. Arthur Holt.



Cacti & Succulent Arrangement by Mrs. Lela Turner

Another Arrangement against the wall by Mrs. E. S. Tanner

Echeveria: 1st: Mrs. Arthur Holt; 2nd: J. Owen Stradling; 3rd: Mrs. Arthur Holt.

Euphorbia: 1st, 2nd and 3rd: J. Owen Stradling.

Gasteria: 1st: J. Owen Stradling; 2nd: John B. Hales; 3rd J. Owen Stradling.

Haworthia: 1st: J. Owen Stradling; 2nd: Bill Rand, 2605 W. McLellan Blvd., Phoenix, Arizona; 3rd: John B. Hales; 4th: J. Owen Stradling.

Kalanchoe: 1st: Mrs. Arthur Holt; 2nd: Edith Carroll.

Mesembryanthemum: 1st and 2nd: J. Owen Stradling.

Pleiospilos: 1st: J. Owen Stradling.

Stapelia: 1st: J. Owen Stradling; 2nd: Mrs. Arthur Holt; 3rd: Ed Stocks.

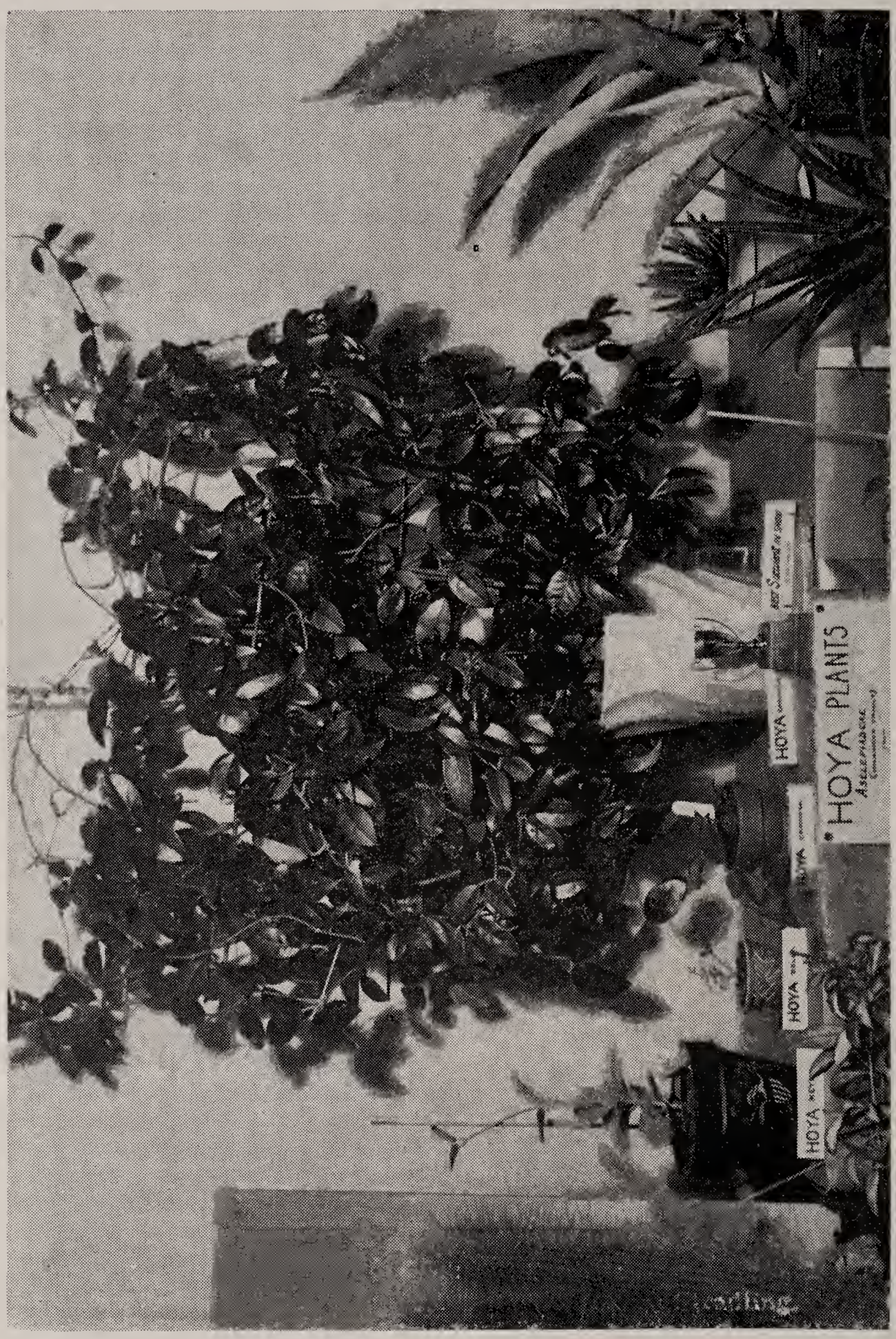
Any Other Species: 1st: Mrs. Hiram Pratt, 5416 E. Avalon Dr., Phoenix, Arizona; 2nd: J. Owen Stradling; 3rd: John B. Hales; 4th: J. Owen Stradling.

Sanseveria: 1st: Mrs. Faith Haft, 5717 W. Clarendon, Phoenix, Arizona.

Collections—5 species of a genus: 1st: J. Owen Stradling; 2nd: J. Owen Stradling.

DESERT TREES AND SHRUBS

1st: Brooks Darlington; 2nd: John B. Hales.



A grouping of Hoya Plants. The larger, exhibited by Mrs. Hiram Pratt, was judged the best Succulent in the Show.

ARRANGEMENTS
DISH GARDENS

Cacti: 1st: Mrs. J. Owen Stradling, 126 S. Drew, Mesa, Arizona; 2nd: Mrs. Helen Friedrichs, Wondervu, Colorado; 3rd: Clifford Schroeder, 2126 Ventura Dr., Tempe, Arizona; 4th: Mrs. Robert Craig, 3140 E. Garfield, Phoenix, Arizona.

Cacti—Junior: 1st: Michael Dankoski, 5902 E. Lewis, Scottsdale, Arizona.

Other Succulents: 1st: Clifford Schroeder; 2nd: Mrs. J. Owen Stradling; 3rd: Mrs. Arthur Holt, 4648 E. Palm Lane, Phoenix, Arizona; 4th: Mrs. J. Owen Stradling, Mrs. Arthur Holt and Edith Carroll, 433 E. Malibu, Tempe, Arizona.

Cacti and Other Succulents: 1st: Mrs. Helen Friedrichs; 2nd: Mrs. Owen Stradlnig; 3rd: Clifford Schroeder; 4th Mrs. Arthur Holt and Mrs. Owen Stradling.

CENTERPIECES—ACCESSORIES PERMITTED

Cacti: 1st: Mrs. Lela Turner.

Cacti—Jr.: 3rd: Kenneth C. Peterson, 6840 Avenida El Alba, Scottsdale, Arizona.

Other Succulents: 1st: Mrs. Marta Carpenter, 1802 N. Laurel Ave., Phoenix, Arizona; 2nd: Mrs. Helen Friedrichs, Wondervu, Colorado; 3rd: Mrs. Lela Turner.

Cacti and Other Succulents: 1st: Mrs. E. S. Tanner, 2250 N| 17th Ave., Phoenix, Arizona.

Natural Dried Desert Material: 1st: Camille Minehart, Rt 2, Box 279, Apache Junction, Arizona; 2nd: Lilliam Lugibihl, 811 W. Howe, Tempe, Arizona; 3rd: Robert M. Small, 4521 N. 20th Ave., Phoenix, Arizona; 4th: three awards to Robert M. Small.

Junior: 2nd: Mary E. Peterson, 6840 Avenida El Alba, Scottsdale, Arizona.

Mexican Influence: 1st: Camille Minehart, Apache Jct., Arizona; 2nd: Mrs. E. S. Tanner

Any Other Centerpiece: 2nd: Dr. and Mrs. Gordon Matheson, 439 E. Malibu, Tempe, Ariz.; 4th: Mrs. Arthur Holt.

ARRANGEMENTS ON/OR AGAINST THE WALL

Cacti: 1st: Mrs. Marta Carpenter; 2nd: Mrs. Glenn H. Hodson, 6841 E. Thomas Scottsdale, Arizona; 3rd: Mrs. E. S. Tanner; 4th: Mrs. Arthur Holt.

Other Succulents: 1st: Mrs. Marta Carpenter; 2nd: Mrs. E. S. Tanner; 3rd: Mrs. E. S. Tanner; 4th: Mrs. Arthur Holt.

Cacti and Other Succulents: 1st: Mrs. E. S. Tanner; 2nd: Mrs. Arthur Holt; 3rd: Mrs. Lela Turner; 4th: Mrs. E. S. Tanner.

Natural Dried Desert Material: 1st: Mrs. E. S. Tanner; 2nd: Mrs. Glenn H. Hodson; 3rd: Mrs. Lela Turner; 4th: 2 awards Camille Minehart.

Mexican Influence: 1st: Mrs. E. S. Tanner; 2nd: Mrs. E. S. Tanner.

American Indian Influence: 1st: Camille Minehart; 2nd: Mrs. E. S. Tanner; 3rd: Mrs. Arthur Holt.

Any Other Arrangement: 1st: Mrs. E. S. Tanner; 2nd: Mrs. Franklin Girard, Rt. 2, Box 434E, Apache Jct., Arizona; 3rd: Mrs. Lela Turner; 4th: Mrs. Edward Comins, 3119 N. 7th Ave., Apt. 103, Phoenix, Arizona.

Corsages: 1st: Mrs. Lela Turner.

Button Gardens: 1st, 2nd, 3rd and 4th: Mrs. E. S. Tanner.

Miniature Arrangements Under 5": 1st, 2nd, 3rd and 4th: Mrs. E. S. Tanner.

Small Arrangements—5" to 8": 1st, 2nd, 3rd and 4th: Mrs. E. S. Tanner.

ARTS — DESERT SUBJECTS

Black & White Photographs: 1st, 2nd and 3rd: Agnes M. Holst, 1902 E. Willetta, Phoenix, Arizona; 4th: Howard M. Soule, 338 W. Cinnabar Ave., Phoenix, Arizona.

Oil Paintings — Landscapes: 1st: Mrs. Warren Rice, 519 Broadmor Dr., Tempe, Arizona; 2nd: Russell McDaniels, 4909 E. Mulberry Dr., Phoenix, Arizona; 3rd: Edward Marshall, Marshall's Inn, Apache Jct., Arizona; 4th: Mr. Omer Lewis, Box 927, Kingman, Arizona.

Oil Paintings — Flowers: 1st: Edward Marshall, Marshall's Inn, Apache Jct., Arizona; 2nd: William O'Leary, 3527 W. Hazelwood, Phoenix, Arizona.

Water Color Paintings: 1st: Wm. A. Manderfield, 8334 E. Devonshire, Scottsdale, Arizona; 2nd: Mrs. Lillie Martin, 343 W. Tamarisk, Phoenix, Arizona; 3rd and 4th: Wm. A. Manderfield.

Any Other Medium: 1st: Robyn Wynters, 1707 W. Maryland, Phoenix, Arizona; 2nd: Clifford Schroeder, 2126 Ventura Dr., Tempe, Arizona; 3rd: Wm. A. Manderfield.

Desert Woods: 1st: Robert M. Small, 4521 N. 20th Ave., Phoenix, Arizona; 2nd: John H. Houzenga, 8233 N. 27th Dr., Phoenix, Arizona; 3rd: O. Mystrom, 1105 Francis, Tempe, Arizona; 4th: Clifford Schroeder.

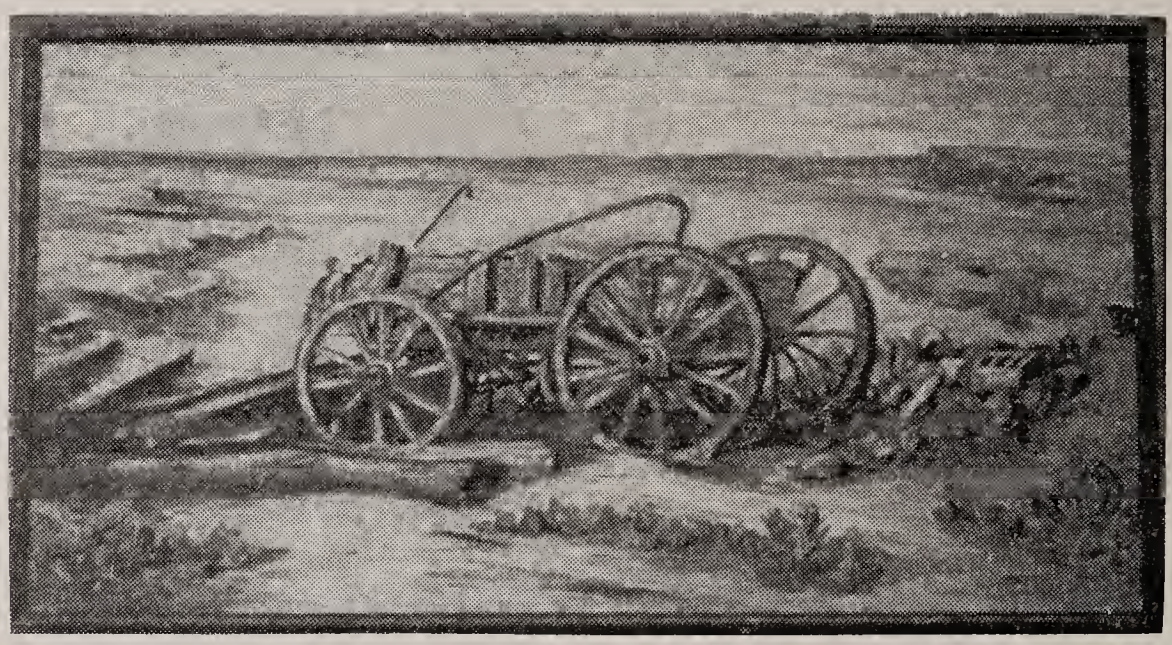
Colored Photographs: 1st: Herbert F. Diegel, 2829 E. Fillmore, Phoenix, Arizona; 2nd: John Woodroffe, Box 1512, Scottsdale, Arizona; 3rd: John Woodroffee.

EDUCATIONAL EXHIBITS

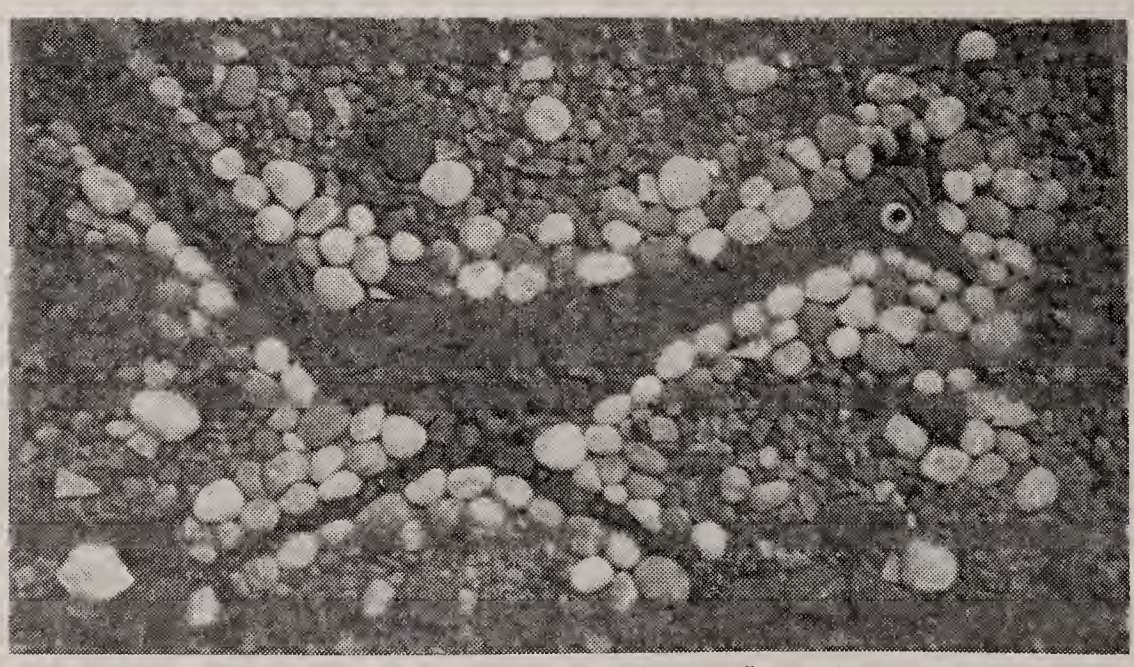
1st: John B. Hales, 1641 E. Willetta, Phoenix, Arizona; 2nd: Warren Donaldson, 11067, 110th Dr., Sun City, Arizona; 3rd: Ed Stocks, 812 Lemon St., Tempe, Arizona.

OPEN—NON-COMPETITIVE

1st: Herbert Bool, 2735 E. Camelback, Phoenix, Arizona; 2nd: Wilson Austin, 1803 Heatherbrae Dr., Phoenix, Arizona; 3rd: O. Mystrom, 1105 Francis, Tempe, Arizona.



Best oil painting exhibited by Mrs. Warren Rice.

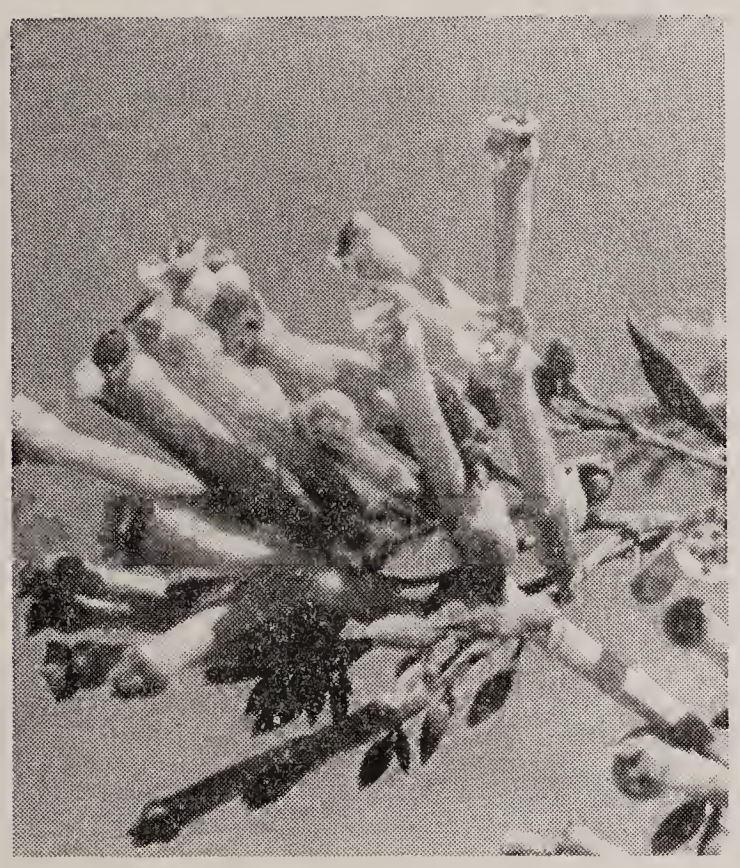


An unusual mosaic Road-Runner bird made of gravel and rocks by Clifford Schroeder.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII April, 1963 No. 4



Tree-tobacco *(Nicotiana glauca)* with a cluster of yellow, tubular flowers ½X. See p. 41.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVII | April, 1963 | No. 4

Arizona Cactus and Native Flora Society

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GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

NOTES FROM THE CORNER OF THE EDITOR'S DESK

A **Ballot** for the annual election of members to the Board of the Arizona Cactus and Native Flora Society, Inc. that sponsors the Desert Botanical Garden is included in this issue. The nominating committee has selected three members whose terms expire April 31. Indicate your choices and a space is provided for 'write-ins.' Please mail at once so that the ballot reaches the Garden's office by May 4th.

The **Annual Members Meeting** will be held Sunday, May 5th, 3 P.M. in the Webster Auditorium at the Garden. Mark this date on your calendar and plan to attend. Reports on the past year's activities and finances will also be given. At that time you will also be surprised to see all the construction in progress in Papago Park and the Garden.

Included with the April issue of the Saguaroland Bulletin is a pamphlet titled CACTI, WILDFLOWERS, and DESERT PLANTS OF ARIZONA, copy by your editor, given to our members through the courtesy of the Arizona Development Board. This organization is to the State of Arizona what a Chamber of Commerce is to a city.

The pamphlet is quite outstanding with its superb color plates taken from past issues of the Arizona Highways Magazine. Additional copies can be procured without cost by visiting or writing the Arizona Development Board, 1500 West Jefferson, Phoenix. This booklet will certainly help to 'sell' Arizona and incidently gives the Garden additional publicity. Your editor was most happy to work with Bernard M. Mergen, Director of their Board, and also Don and Paulis, Inc., Phoenix, the 'lay-out' artists.

The demand has been so great that the Garden has reprinted another 5000 copies of Information on **Flowering of the Southwestern Desert Plants.** This free pamphlet (4 pages) will give you information as to where and when blossoms can be seen of the Wildflowers, Cacti, Trees, Shrubs and other Succulent Plants. Phone or write for free copies for yourself and your friends. This is another of our many "good-will" gestures to help folks needing information about our fascinating desert.

The **Wildflowers** in our Valley have had a severe 'set-back' this past winter due to the January freeze. Many blossoms are now in evidence through the foothills of southern Arizona. The Palo Verde trees are in bud, Cacti are opening slowly and the Ocotillos are showing many flower stalks. April 5th to April 25th will be the 'big-show' for at that time the wildflowers, cacti, trees, shrubs and other plants will be showing vivid flowers until the 'drying-up' period caused by the hot dry winds in late April.

FROST DAMAGE TO CACTUS

By CHARLES MIEG, Scottsdale

The unusually cold weather in January, 1963, has destroyed or damaged many Cacti and other plants. For more than a week the night temperatures dropped to as low as 20 degrees and a few degrees lower in the low portion of the valley. But from this calamity there can be drawn several lessons which may save many plants in the future.

Almost totally destroyed were most of the Aloes, Stapelias, some Mexican Agaves, Delonia, Bougainvillea, Jacaranda, Lantana and leafy succulent plants. Among the Cacti almost all of the seedlings were lost, these were **Echinocactus grusonii,** (up to 2"), **Nopalea, Acanthocereus, Pereskiopsis, Cephalocereus, Echinocactus, Pachycereus pringlei, P. pecten aboriginum, Lemaireocereus montanus.**

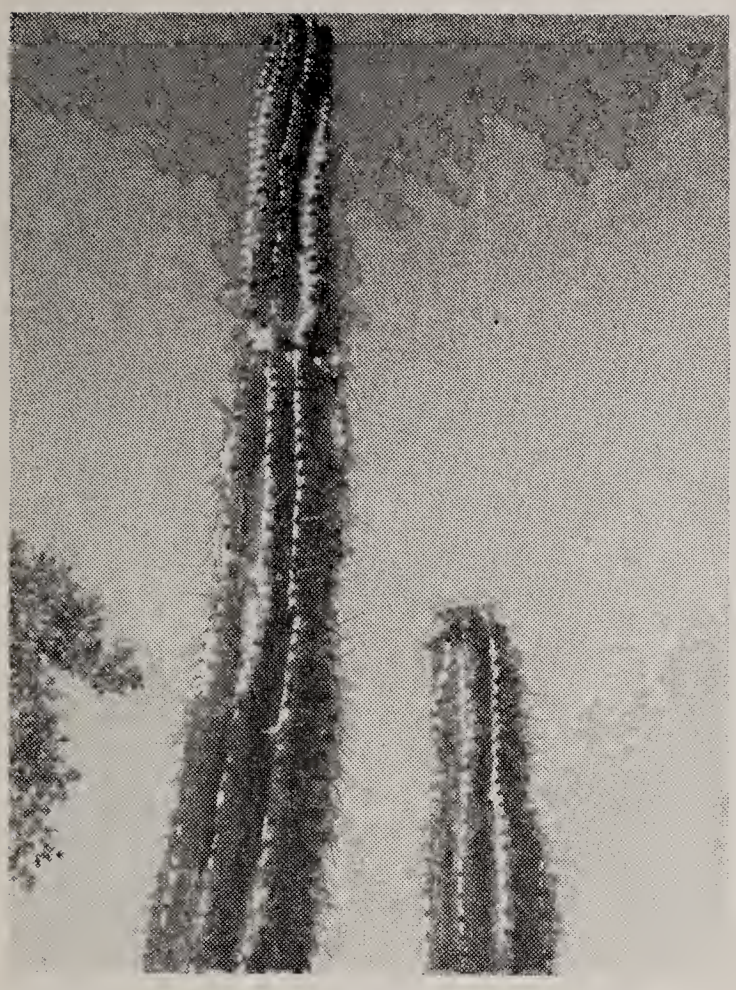
Frozen branches of *Lemaireocereus pruinosus* that will have to be pruned off plant.

Also badly damaged were the following large plants: **Pachycereus pecten aboriginum. Lemaireocerus pruinosus, L. stellatus, L. marginatus, L. hollianus. L. dumortieri, L. martinezii, L. standleyi, Cereus peruvians, C. hildemannianus, Myrtillocactus cochal, M. geometrizans, Espostoa lanata, Escontria chiotilla, Eriocereus martinii, Rathbunia sonorensis, R. kerberi, Penicereus johnstonii, P. roseі, Lophocereus australis, L. sargentianus, Wilcoxia poselgeri, Neobuxbaumia, Cephalocerei, Azurocerei, Bergercactus emoryi** and the **Opuntias** of southern Mexico.

Shrubs that were greatly damaged were **Fouquleria macdougalii, F. peninsularis,** Ironwood, Elephantwood, Hibiscus and "copa de oro" **(Swartzia nitida).**

Not damaged by the low 20 degree temperature were the following: all of the Palo Verde trees, Yuccas, Boogum trees, Mamillarias, Coryphanthas, Echinocerei except for **Echinocereus pensilis, Stetsonia coryne,** Carnegiea (Saguaros). Ferocactus, Echinocactus, and other Arizona species, **Lemaireocereus weberi, L. chichipe, L. chende, Pachycereus orcuttii, Cephalocereus sensilis,** Echinopsis, Oreocereus, Notocactus, Trichocereus, Lobivia, Thelocactus, Astrophytum, Gymnocalycium and Mammilarias.

A few notes may help to keep damage down in the future. The major damage was done to the new growth and the plants which were full of moisture suffered much more than the partly dry plants. It must be stated that watering outdoors should not be done after October 1st, (a practice which I wish I had followed myself). Paper sacks or plastic bags placed over the plant tips will almost eliminate this damage. Over large plants plastic sheets, weighted down to keep from blowing off the plants, will be of great help. Seedlings must be protected by taking them in-



Frozen rib-edges, now turned to a yellow color of *Lemaireocereus montanus*.

doors for the duration of the freeze. Plants under trees (Palo Verdes, Ironwoods and Mesquites) will suffer much less than those plants in the open.

It is noted that plants of the same species have different tolerance to the cold. For instance, **Myrtillocactus geometrizans** collected near Tehuacan, Mexico, did not freeze in spite of its turgidity and being unprotected. Frozen portions of a cactus turn in color fast and dry up. It appears that the moisture in the damaged parts is drawn back into the undamaged portion of the plant which then swells up in proportion and the result has been a splitting open of the undamaged trunk and branches about two weeks after the freeze. Thus, the frost damage is compounded and provides another argument in favor of drying up the cacti for winter. Exceptionally cold weather occurs about once in ten years and should be carefully provided for, if not, many years of loving care can be wiped out in one bad night.

NICOTIANA GLAUCA — Family SOLANCEAE

TREE TOBACCO
DON JUAN

By John H. Weber

DESCRIPTION:

NICOTIANA GLAUCA grows into a several stemmed shrub or small tree having a trunk diameter of three to six inches. It is normally evergreen with smooth blue-green bark and foliage. As a tree, it attains the height of fifteen or more feet depending on the amount of moisture available. The leaves are ovate in shape and from two to six inches in length. Leaf margins are entire, and the surfaces of the long pedicelled leaves are glabrous and very glaucous with a heavy bloom. Flowers are diurnal and have a paniculate arrangement at the ends of the branches. The tubular-funnelform corolla is yellow and measures 1.5 inches long and 3/16 of an inch in diameter. Flowering is of an extended period, being almost continuous. Fruit consists of a dry, ovoid capsule about one half inch long. This capsule splits open to release numerous, small, brown seeds.

DISTRIBUTION:

Tree-tobacco is native to Argentina and Chile, but is extensively naturalized in the tropic and subtropic regions of the western hemisphere. It is also found in Uruguay, Paraguay, Bolivia, and in Mexico from Sonora to Tamaulipas and Oaxaca. It extends into the

Tree-tobacco, *Nicotiana glauca,* three years old and nine feet tall.

United States in Florida and from western Texas through southern New Mexico, south and central Arizona, and into southern California. Locally in Arizona, tree-tobacco ranges from Cochise, Greenlee, and Graham counties west and northwest into Pinal, Pima, Gila, Maricopa, Yuma, Mojave, and Coconino counties. It reaches an upper elevational level at about 3,000 feet in Arizona, and a lower level of just above sea level on the coastal plain of western Mexico. This plant occupies moist situations near roadsides and cultivated areas, as well as stream and ditch banks and washes.

UTILIZATION:

NICOTIANA planted on both sides of a picture window will provide frequent opportunities to observe hummingbirds feeding from a close vantage point. Having a herbaceous leafy growth, no danger to the glass is entailed by the use of this plant. It also provides excellent growth cover for moist areas such as septic tank leach beds and evaporative air conditioner drains. The blue-green color creates a break in the grey-green and yellow-green color scheme of most desert vegetation.

CULTURE:

Tree-tobacco can be planted in sandy or rocky soils and on any exposure. Some freeze damage will occur when temperature drops below 20° F, but recovery is rapid with the advent of warm weather. On dry sites, deep irrigation should be applied during extended hot and dry periods.

PROPAGATION:

NICOTIANA is easily propagated from seed with no pre-treatment being necessary. Many of the capsules are infested with beetles so that the seed should be extracted and then stored in a cool dry place to be installed the following spring. Seed can be sown in place, lightly cultivated in, and then kept moist until germination takes place. Transplants should be moved while they are still small.

REMARKS:

Livestock normally avoid this plant, but there are suspected cases of poisoning from it.

REFERENCES:

Benson and Darrow—The Trees and Shrubs of the Southwestern Deserts.

Kearney and Peebles—Arizona Flora.

Little, Elbert L.—Southwestern Trees.

Standley, Paul C.—Trees and Shrubs of Mexico.

ARIZONA POINT OF INTEREST

PICACHO PEAK, (Spanish-'Peak or Point') with an elevation of 3376′ is an outstanding landmark 40 miles N_W of Tucson. Each spring its slopes are usually covered with golden poppies *(Eschscholtzia mexicana)*. This area was the scene of a battle between the Confederate and Union forces during the Civil War. Saguaros, Prickly-pears, Hedgehogs, Palo Verde trees and Creosote bushes exist on this rocky desert despite the daily, dry temperatures of 100-120 degrees through early May to late September.

DESERT MALLOW
GLOBE MALLOW
APRICOT MALLOW
SORE-EYE-POPPY

SPHAERALCEA AMBIQUA
MALVACEAE
MALLOW FAMILY

Is one of our largest flowered, many branched and xerophytic species of the **Sphaeralcea.** The English and botanical generic name is derived from the combination of two Greek words, **spaira,** ball or sphere-like and **alkea,** mallow; whereas the specific name, **ambiqua** means—uncertain as to its affinities or relationships.

The large red or grenadine colored blossoms make it an outstanding and eye catching common plant found along our roads and in the deserts of southwestern Utah, southern Nevada, southern California, northern Baja, California, northern Mexico and southern Arizona, blooming quite freely through the months of March, April and May.

A person has to be careful in picking the flowers or handling the stems as they are covered by coarse hairs that will irritate your eyes and is referred to by the Mexican Indians as "mal-de-ojos" (bad for the eyes) or "plantas muy malas" (very bad plants). Paradoxically, the Pima Indians apply a poultice of this plant's leaves to those persons with eyes infected from other sources.

A many-branches plant of Globe-mallow, three feet tall with winter foliage.

Globe-Mallow flowers ½X.

Cattle, deer, sheep and goats browse only on the young tender growth of these plants as the older growth is irritating to their mouths and throats.

Horticulturly this is an attractive perennial that needs very little water. The old dead stems should be trimmed out and the plant 'shaped-up' after blooming season giving you plants that will give you exciting color each year.

COMMENTS ABOUT THE GARDEN

Last fall we placed a new Guest Book in the Visitor's Building and provided in it a space for comments by our visitors. We feel that you, as members and supporters of the Garden, would appreciate the reaction of a few of our visitors when they registered, during a period of one week, the following comments:

D. B., Bell, Calif.—"Best in the world."

F. H. H., Omaha, Neb.—"An interesting and well presented attraction."

V. S., Vancouver, Can.—"Most informative."

F. L. T., Henryville, Pa.—"Enlightening, educational and well arranged."

V. F. M., Arcadia, Calif.—"Our third wonderful visit."

E. W., Brandon, Can.—"Everything interesting and beautiful."

C. D. B., Brewer, Maine—"Very different."

E. U., Beverley Hills, Calif.—"The Indian uses were fascinating."

H. G., Des Moines, Ia.—"A 'must' for every Iowa visitor."

W. P. L., Paynesville, Minn.—"Out of this world!"

T. D. E., Kansas City, Mo.—"Very easy to get stuck here."

J. W. J., Glendale, Calif.—"Fine for the 3rd visit in 3 years."

L. A. K., Narasarovupet, India—"Unusual, similar to Indian cactus."

R. D. S., Cambridge, Mass.—"Have worked many years in a botanical garden; this is a most interesting display."

J. P. M., Lima, Peru—"A well done job; should have more plants labeled."

F. C., Jerome, Idaho—"Very beautiful and well kept up."

A. H., Rakkestad, Norway—"Nice."

G. J. A., Phoenix—"A beauty spot of Our West."

G. E. R., Chanute, Kan.—"Our boys enjoyed it very much."

E. R., Hotchkiss, Colo.—"This display shows an unbelievable amount of careful, painstaking work."

M. B., Glendale, Arizona—"We are so proud of this garden."

P. L. E., N. Y. City—"Please let everybody in the U.S.A. know about this marvelous place."

J. B., London, England—"Jolly interesting."

J. D., Stronghurst, Ill.—"Better all the time."

R. D., Windsor, Ont.—"An education."

T. S., Putarure, N. Z.—"Very pretty."

N. R., Tokyo, Japan—"Very great."

C. L. R., Cheney, Wash.—"The world is full of beauty with an excess in this Garden."

J. N., Madras, Spain—"Very good work."

J. E., Ahenedabad, India—"Something superb."

W. M. A., Lovelocks, Nev.—"One of the finest collections."

H. M., W. Hempstead, N.Y.—"Amazing and fascinating"

Enough remarks! If you wish to see more of them then stop in at the Visitor's Building and look through the Guest Book.

Genus 3. *LEMAIREOCEREUS* Britton & Rose 1909

50. *LEMAIREOCEREUS THURBERI* (Engelmann) Britton & Rose 1909.

Cereus thurberi Engelmann 1854
Pilocereus thurberi Rumpler in Forster 1885
Marshallocereus thurberi Backeberg 1950

A large clustered plant, usually without a trunk, sending out large branches, 10' to 22' high, 5" to 8" in diameter, basal branches will arise from the main portion of the plant and others from the basal branches until the plant may be 15' to 30' in diameter; ribs are numerous, 12 to 7, low but about ¾" high, rounded, separated by narrow areoles ½" to 1¼" apart, large sometimes ½" in diameter, circular, brown-felted; spines numerous, acicular, unequal, brownish to black, becoming gray in age but still retaining a black tip, 2" long, brittle; flowers borne near tip of stems, 2" to 2½" across and as long, including ovary, nocturnal, white inner petals, outer petals reddish, petals recurving; fruit globular, edible, very shiny, spiny when ripe, flesh red, staining; seeds black, shining, 1/16" to ⅛" broad.

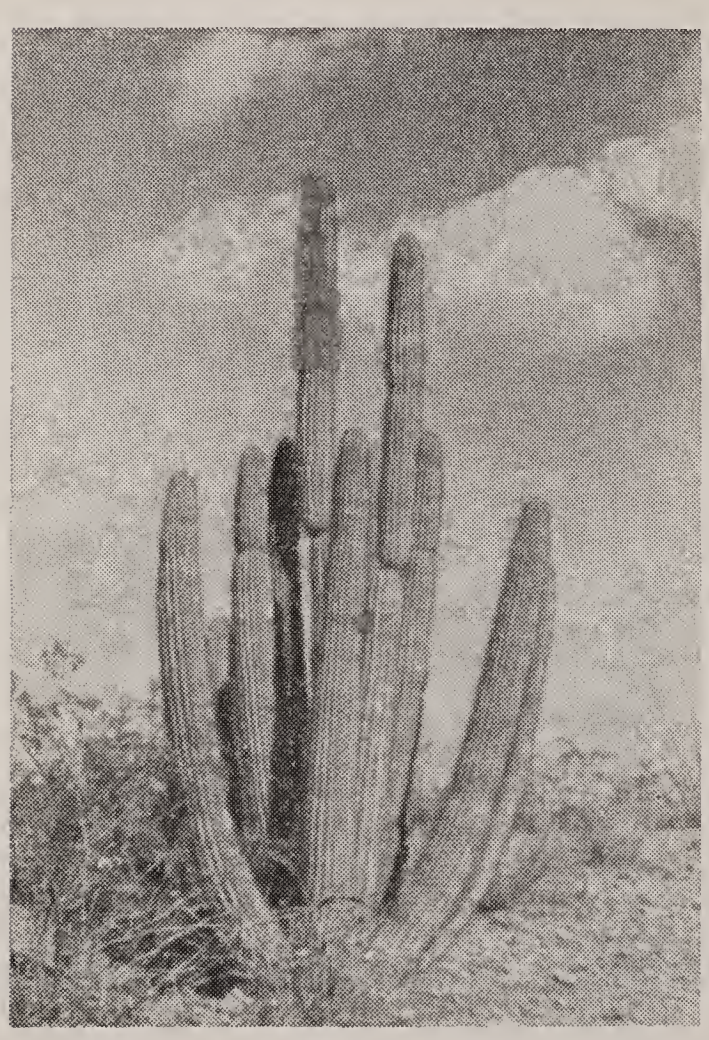


Fig. 55. *Lemaireocereus thurberi*, 9' tall.

This interesting plant is found in the Organ Pipe Cactus National Monument, its most northerly range, and extends far down into Mexico. East of Los Mochis, Sinaloa, the plants have a definite trunk up to 10' high and then ascending branches that arise to 30' and 40', having the appearance of our Saguaros.

The fruits of this plant are quite sweet and are relished by the Indians. They are combined with the fruits of the Prickly Pear to make a candy called Dulce Pitahaya, which is often found in the markets of Mexico.

The branches of this plant arise from the main plant in such a manner that it gives the plant the appearance of a group of organ-pipes, hence the name —Organ-Pipe Cactus.

TYPE LOCALITY — Canyon near the mountain pass of Bachuachi, Sonora, Mexico.

DISTRIBUTION — Ajo mountains, Ariz., western Sonora and both coasts of Lower California.

The preceding page is an excerpt from the new book by your Editor, 'CACTI of the SOUTHWEST' and published by the Garden. It is meeting with popular appeal and the demand is exceeding expectations. Now available at our Bookstore and book dealers through the southwest.

Lemaireocereus thurbei (Eng.) B. & R. Habitat photo in Organ Pipe Cactus National Monument.
R. C. Proctor photo

WILDFLOWERS

A bed of Desert-marigolds *(Baileya multidariata)* that are abundant in the Garden this spring. Many good displays of other wildflowers will continue in the Garden until early May.

April	2nd	8 P.M.	CACTOMANIACS—'Wildlife in Tanganyika,' by Dr. Lake S. Gill
April	3rd	3 P.M.	CLASS—Culture of Desert Trees
April	4th	3 P.M.	LECTURE—Succulents other than Cactus
April	6th	9 A.M.	FIELD TRIP with Audubon Club
April	10th	9 A.M.	FIEL DTRIP with Class
April	11th	3 P.M.	LECTURE—Collecting Plants in Mexico
April	18th	3 P.M.	LECTURE—Arizona Cactus in Bloom
April	21st	10 A.M.	FIELD TRIP—Pena Blanca & Sycamore Canyon
April	25th	3 P.M.	LECTURE—Arizona Wildflowers

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII May, 1963 No. 5

Cercidium sonorae, another recent successful introduction to the Valley by the Garden. See page 56.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVII | May, 1963 | No. 5

Arizona Cactus and Native Flora Society

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President ..... Lou Ella Archer
Vice President ..... John H. Rhuart
Treasurer ..... Tom Goodnight
Secretary ..... Angela Bool
Chief Counsel ..... Richard B. Snell

Reg Manning, Edward Burrall, Charles Mieg, Mrs. Mildred May

ADVISORY BOARD

Chairman, Les Mahoney

James Cahill, Mrs. Walter Douglas, Mrs. Geraldine Eliot, Mrs. Charles Gilliland, Mrs. Homer Lininger, Miss Eleanor B. Sloan

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Desert Botanical Garden of Arizona

STAFF

Director ..... W. Hubert Earle
Horticulturist ..... John H. Weber
Maintenance & Bookstore ..... Wm. C. Hendrix
Bookstore ..... June Hendrix
Student Horticulturist ..... Don Cole
Student Horticulturist ..... Terry Truesdell

GARDEN OPEN DAILY 9 A.M.—5 P.M.
Including Week-ends and Holidays

MEMBERS ANNUAL MEETING

Was held Sunday, May 5th, 3 P.M., in the Webster Auditorium with Mrs. Angela Bool as acting chairman.

Hot weather and construction of new Park roads provided a small attendance. 'Mailed-in' ballots were tabulated by Mrs. Clifford Schroeder and Mrs. Lois Porter Earle. Incumbent board members Mrs. Lou Ella Archer, Mrs. Angela Bool and Richard B. Snell were elected to three-year terms.

Reports of the past year's activities and a successful financial year were given by the Director.

28TH ANNUAL BOARD MEETING

Members of the Executive and Advisory Boards and their husbands and wives enjoyed another annual dinner meeting in the Lanai room of the Safari Hotel, Scottsdale, May 9th.

MINUTES of the annual Members' meeting and Board meetings were read by Secretary Angela Bool and approved.

ELECTION of officers was accomplished by members assuming offices they held during 1962-1963 as indicated on page 50.

FINANCIAL report, shown on page 53, was given by your director as Treasurer Tom Goodnight was out of town. A report of the past year's activities and plans for 1963-1964 were also given.

BIDS for the paving of our new entrance road and parking lot were presented by Chas. Mieg. A contract was awarded to the Fisher Construction Co. to pave 7,500 sq. yards. A bid will be asked to fill and pave an additional 900 sq. yards adjacent to present parking lot. Bids on the striping and placing of bumping blocks, erection of direction signs to the Garden were reviewed and left to the authorization of the Building committee.

EXCHANGE of the northwest portion of our Garden, that is now 'cut-off' from the Garden due to the new road through the Park, for an adjoining portion adjacent to our west line by the City Parks Board was reviewed by Les Mahoney who reported that progress appeared quite favorable. He commended Richard B. Snell for his excellent presentation at the City Board meetings.

REFRIGERATION cooling of the Webster Auditorium was discussed and equipment and costs are to be presented at a later meetings.

The VOLUNTARY ADMISSION plan of 25c for adults and 10c for children was tried out last summer. The Board favored its continuance as evidenced by the return shown in the financial report.

A LIFE MEMBERSHIP was voted to Mr. and Mrs. Rod McGill for their presentation of hundreds of plants, many rare, to the Garden collected during their many trips to Mexico.

CHECKS of five hundred dollars each were unexpectedly presented to the Director and his wife, Lois, to be used against expenses incurred during trip to Japan. The Garden was honored by receiving an invitation to the opening of the new Manazuru Botanical Garden near Lake Kawoguchi and to give illustrated lectures of Arizona and Mexican cacti at Kyoto, Tokyo, etc., May 20th to June 1st. The trip will be extended to botanical gardens in Hong Kong, Singapore, Bangkok, Manila and Hawaii to inspect succulent plants that we have furnished over the past five years.

Meeting adjourned at about 10 P.M.

DIRECTOR'S REPORT

1962-1963 was another busy year despite a slight drop in attendance due to the coldest winter on record, the number of tourists was less than previous year and the continual construction work in Papago Park.

Visitors to the Garden, after June 4th, will be surprised to find a new, sweeping, paved road through the Garden and Papago Park. This road and our newly paved parking lot will now encourage timid souls to visit the Garden—for the past 25 years our garden roads were for the venturesome.

Construction work during the past year was not too intense as we were increasing our Building Fund for this year's contracts which will include roads, parking lot, fencing, stone entrance ways, water lines, signs, ramadas, footings for additional 4900′ aluminum lath-house, etc.

Financially 1962-63 was good with a big 'shot' gained through the 'Voluntary Admission.' 1963-64 should show another income increase of about 15%.

Memberships lacked only three of our 1962-63 goal of 700 members. Two Life Memberships were taken out by Mr. and Mrs. Brooks Darlington, Scottsdale.

Inventory of our Bookstore was over $8000 which is $5000 more than last year and the highest to date. This was due in part to our publishing CACTI OF THE SOUTHWEST—Earle, 5500 copies and the purchasing of the remaining 1600 copies of SUCCULENT PLANTS OF NEW AND OLD WORLD DESERTS—E. J. Alexander, from the New York Botanical Garden and the 1400 remaining copies of SUCCULENT PLANTS AND HOW TO GROW THEM—Scott Haselton, Abbey Press.

Tax-exempt donations to the Garden are always most acceptable and were as follows:

Ernest Beahm, Pasadena—36 Epiphyllums
Mr. and Mrs. Brooks Darlington, Scottsdale—$100 for Plant Research
Mrs. Liscum Diven, Scottsdale, $10 to Library Fund
E. F. Frazier, Phoenix, $50 Research
Paul Hoffman, Scottsdale, six books to Library
Reg Manning, Scottsdale, sketch
Mrs. Helen Phillips, McFarlane, Calif., $15 Bookbinding Fund
M. C. Richter, Santa Barbara, 1959 Botanical Abstracts Index
Mr. and Mrs. George Spaulding, Phoenix, Rhodesian Botany books

Whit Evans, Phoenix, L. S. Wakefield, Phoenix, Charles Genasci, San Francisco, donated slides to our slide library.

ARIZONA CACTUS & NATIVE FLORA SOCIETY

Sponsoring the

DESERT BOTANICAL GARDEN

FINANCIAL REPORT

May 1st, 1962 - April 30th, 1963

INCOME

	Budgeted	Actual	1961 - 1962 Comparison
Retail Sales	$40,000	$34,370.10	$37,663.15
Sale of Seed	2,000	1,614.10	2,507.76
Sale of Cuttings, plants	200	66.50	110.00
Contributions	2,200	853.11	2,110.59
Voluntary Admissions	———	9,387.50	———
Memberships	3,200	3,281.40	3,066.86
Wholesale (books)	1,000	956.97	62.13
Endowment, Webster Trust	11,150	10,509.93	11,037.92
Miscellaneous (Sales Tax)	1,800	———	1,622.41
	$61,550	$61,039.76	$58,180.82

EXPENDITURES

Purchases for resale	$24,000	$22,718.76	$21,433.55
General expense	4,800	5,189.00	4,721.28
Buildings and Improvements	3,500	3,074.98	1,962.34
Auto Operation	650	517.08	796.94
Utilities	1,700	1,667.88	1,650.75
Insurance	1,150	1,373.78	1,116.51
Misc. (Sales taxes, etc.)	1,250	1,241.19	1,165.47
Salaries	20,000	19,460.11	18,334.96
	$57,050	$55,242.78	$51,182.50

ASSETS

Accounts receivable (books)	$ 111.95	$ 11.25
Inventory	8,275.47	3,703.89
Deposit Ariz. Indus. Com.	96.00	96.00
Cash—		
Valley Nat'l. Bank (Checking)	2,551.69	1,854.77
Valley Nat'l. Bank (Building Fund)	10,424.96	6,315.78
First Federal Loan & Savings (Life)	1,400.52	1,228.94
Petty Cash on hand	79.00	74.00
	$22,939.59	$13,284.63

LIABILITIES

State Withholding Tax	7.45	7.63
Accounts Payable	0.00	0.00
	$22,932.14	$13,277.00

CAPITAL GAIN

Water Bubbler—Visitors Bldg.	$ 187.72	
Installation Fluorescent lights	695.00	(Auditorium)
Purchase 106 chairs for Auditorium	430.00	
Added 900 sq. ft. to Propagation sec.	110.00	
Bought 4900 sq. ft. lath-house, used	2,000.00	
Additional camera equipment	215.00	
	$3,637.72	

ANTICIPATED BUDGET FOR 1963-1964

Income		Expenditures	
Retail Sales	$40,000	Purchases for resale	$22,000
Sale of Seeds	2,200	General Operating expense	5,000
Sale of Plants & Cuttings	200	Bldgs. & Improvements	2,500
Contributions	500	Auto operation	600
Voluntary Admissions	11,000	Utilities	1,700
Memberships	3,300	Insurance	1,400
Wholesale (books)	2,000	Sales Tax	1,250
Endowment (Webster Estate)	10,500	Salaries	23,000
	$69,700		$57,450

1963-1964 Garden Improvement Program

Pave, with asphalt, parking lot and new entrance roads	$ 5,100
Erection of new directional signs to Garden	275
Landscape new entrance to Garden	600
Additional water lines	225
Add carport to Archer dwelling	1,100
Erect Aluminum lath-house purchased at receiver's sale	650
	$ 7,950

MEMBERSHIP of the Garden is now 697, the highest to date.

ATTENDANCE for past year was 90,371.

The following groups met **at the Garden:**

65	Elementary School Classes	2,545
9	High School classes	326
11	University classes	268
15	Desert Plant classes	609
24	Illustrated lectures	811
9	Cactomaniac meetings	633
1	16th Annual Cactus Show	13,229
3	Maricopa County Youth Work Groups	174
1	Desert Institute	46
4	Garden Clubs	151
3	Convention groups	418
3	Senior Citizen tours	190
10	Boy Scouts, Cubs, etc.	180
21	Girl Scouts, Campfire, etc.	376

Lectures were given to the following groups **away from the Garden:**

3	Desert field trips	113
4	Williams Air Base classes	210
1	Desert Institute	65
3	Grade Schools	237
4	Garden Clubs	132
3	Senior Citizens groups	196
4	Service Clubs	163
1	Audubon tour	36
1	Arizona Hort. Society	32
1	City Parks Art Class	36
3	Botanical Societies	188
1	Phoenix Camera Club	76
1	Los Angeles Cactus Club	118

Summer Program—

May—Attend opening of new Manazura Botanical Garden in Japan. Give lectures at Kyoto and Tokyo.

June—Visit Botanical gardens at Hong Kong, Singapore, Bangkok, Manila and Hawaii.

July—1963 Cactus Society Convention, San Diego, July 9-14th, will be attended by many of our members.
Publish an index of the **Saguaroland Bulletin.**

August—Print a 'hand-out' program of the Garden's 1963-64 activities for distribution to newspapers, Garden Clubs, Service Clubs, hotels, motels and our visitors.

ARIZONA POINT OF INTEREST

GRANITE DELLS, a colorful granite outcropping of grotesque rocks 4 miles north of Prescott along Highway 89 is a favorite summer recreation area with an elevation of 5320′ with its shade trees, lakes and a clear mountain stream, Granite Creek.

CERCIDIUM SONORAE — Family LEGUMINOSAE

SONORAN PALO VERDE

BREA

By John H. Weber, Horticulturist

A three year old *Cercidium, sonorae* with golden blossoms along entire length of its branches.

DESCRIPTION:

CERCIDIUM SONORAE is a small to medium sized tree attaining a height of six meters (20′). The trunk is erect up to two meters, then branches horizontally into a rounded wide-spreading crown with the lower branches recurving downward. Trunk and branches are deep green in color and are covered with a coating of wax. The branches are armed with a single spine at each node measuring 10 to 15mm. in length. Leaves are bipinnate, the secondary leaflets numbering five to eight pairs. These small green leaflets measure 6 to 8mm. in length and 3mm. in width, and are drought deciduous. The deep yellow flowers are arranged in close clusters throughout the length of the branches. The individual flower is 15 to 18mm. in diameter, and has a petiole 6 to 8mm. in length. The base of the banner petal is slightly spotted with red. The flattened pod is oblong and measures 4 to 6cm. in length and 8 to 10mm. in width. No beak is present nor is any constriction apparent between the seed. Commonly two flat and oblong seeds are present, measuring 8 to 10mm. in length and to 5mm. in width.

DISTRIBUTION:

Sonoran Palo Verde grows at elevations ranging from sea-level to near 400 meters. It is not abundant, nor is it found in pure stands. The Brea is found on rocky slopes and coarse outwash plains in association with **Prosopis sp.** and **Pachycereus pecten-aboriginum.**

The central part of the sonoran plains and the foothill areas near Ures and Moctezuma are the northern limit of distribution for CERCIDIUM SONORAE. It is more common from Guaymas south to the terminus of the Sonoran Desert. Ranging inland, it is found along the

Close-up of *Cercidium sonorae* flowers, 1 1/3 X

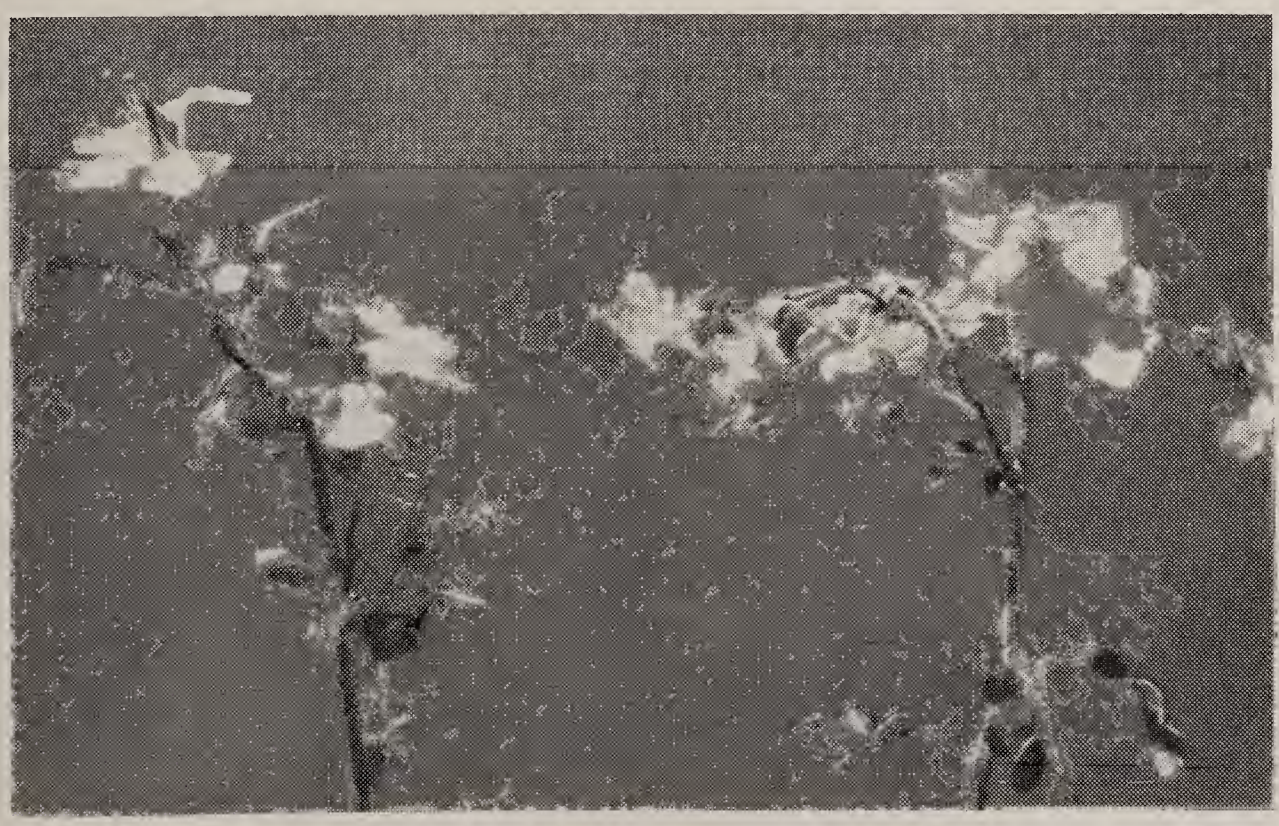
roads to Batacosa, Quiriego, and Alamos, Sonora.

UTILIZATION:

If used for screening purposes, the Sonoran Palo Verde would be very effective either by itself or in combination with Mesquite, Acacia, and other species of Palo Verde. It also provides partial shading for succulent plantings that will not tolerate full sun. As a flowering tree, CERCIDIUM SONORAE is superior to the other three species of Palo Verdes grown in southern Arizona. Its flowering period is concurrent with that of CERCIDIUM FLORIDUM and prior to that of CERCIDIUM MICROPHYLLUM and PARKINSONIA ACULEATA. The long branches of deep yellow flowers creates the same effect as that of **Forsythia** of eastern gardens.

CULTURE:

A well-drained soil is required as well as frequent deep irrigation during dry seasons until the plant is well established. As is the case with other species of Cercidium, adequate space is needed for this plant to attain the normal growth form. The Sonoran Palo



Left: *Cercidium sonorae* with blossoms along the branch. Right: *Cercidium floridum* (Blue-stemmed Palo Verde) with terminal cluster of blossoms.

Verde has wide limits of temperature tolerance; having withstood a low of 17°F. without incuring damage and highs up to 115°F. To develop an erect tree branching head high, it is necessary to frequently prune the lower branches through the second year of growth.

PROPAGATION:

Scarification of the impermeable seed coat is necessary to allow penetration of water. Soaking the seed overnight in water that has been brought to the boiling point will also break the impermeability. Germination and growth rate are both rapid, producing a large flowering tree with three years growth. Seed of this species has not shown the high degree of infestation by bean weevils that is exhibited by the other Palo Verdes.

REMARKS:

This Palo Verde has proved to be the best woody plant introduction to date that the Garden has made. A rapid growth rate with a profusion of flowers in early and mid-spring make it a desirable ornamental tree for mild areas of the southwest.

REFERENCES:

Gentry, Howard S.—Rio Mayo Plants.

Shreve, Forrest—Vegetation of the Sonoran Desert.

The following clipping is from the April 30th edition of the Phoenix-Gazette and is self-explanatory.

TWO FINED

WARNING: CACTUS PROTECTED

In case you didn't know it, you've got to get a permit to haul cacti on a public highway in Arizona.

The 30-odd–year-old law was in the news today because two men were fined $50 each in Mesa Justice Court for "illegal possession of cacti." And sheriff's deputies were seeking two other alleged offenders.

Transportation permits, good for 30 days, are issued for $5 each by the office of the state entomologist at 1688 W. Adams. W. T. Mendenhall, entomologist, said several are issued each week.

But only scientific and educational institutions may remove cacti from public lands. They are given a permit gratis, Mendenhall said.

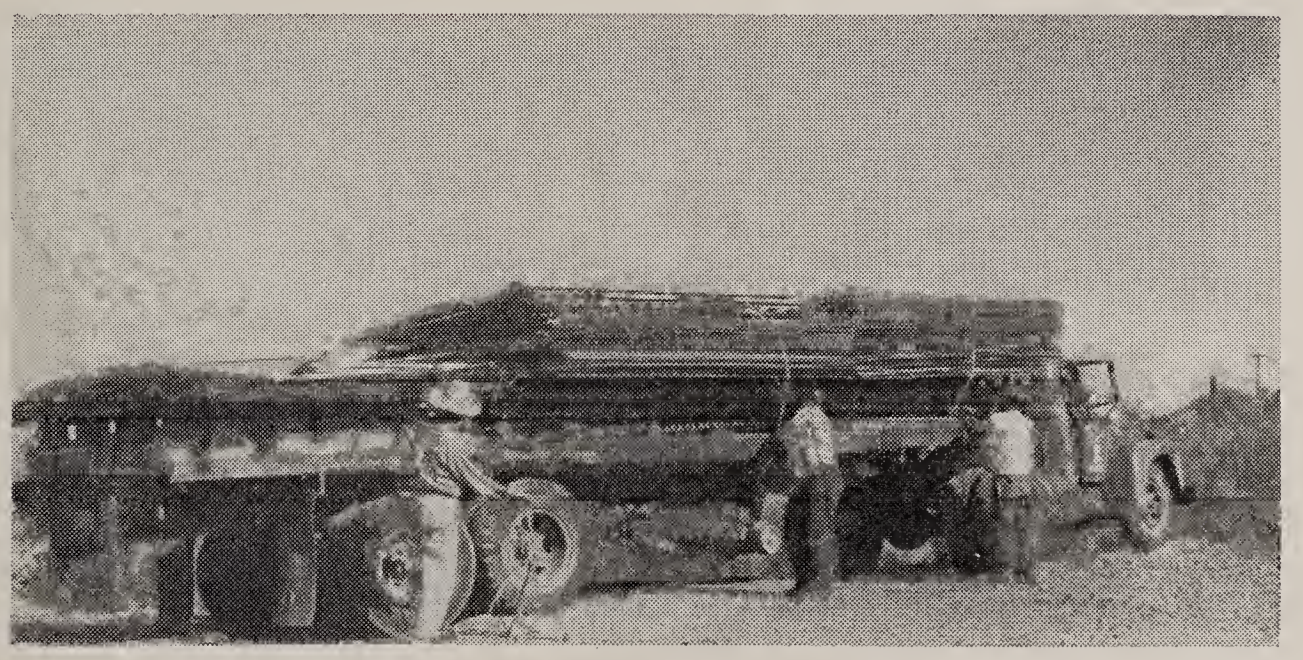
Those requesting permits to haul cacti from private land must first obtain written permission from the land owner to take the cacti.

Mendenhall said he knows of about four instances recently in which sheriff's deputies and other law enforcement officers have made arrests for illegal possession of cacti.

Deputy D. J. McAfee arrested the two men who appeared in Mesa Justice Court. The two were identified as Charles E. Robertson of Apache Junction, and Robert O. Clark, of 2634 N. 80th St., Mesa.

One man being sought allegedly hauled cacti out of the state to sell to a nurseryman in California.

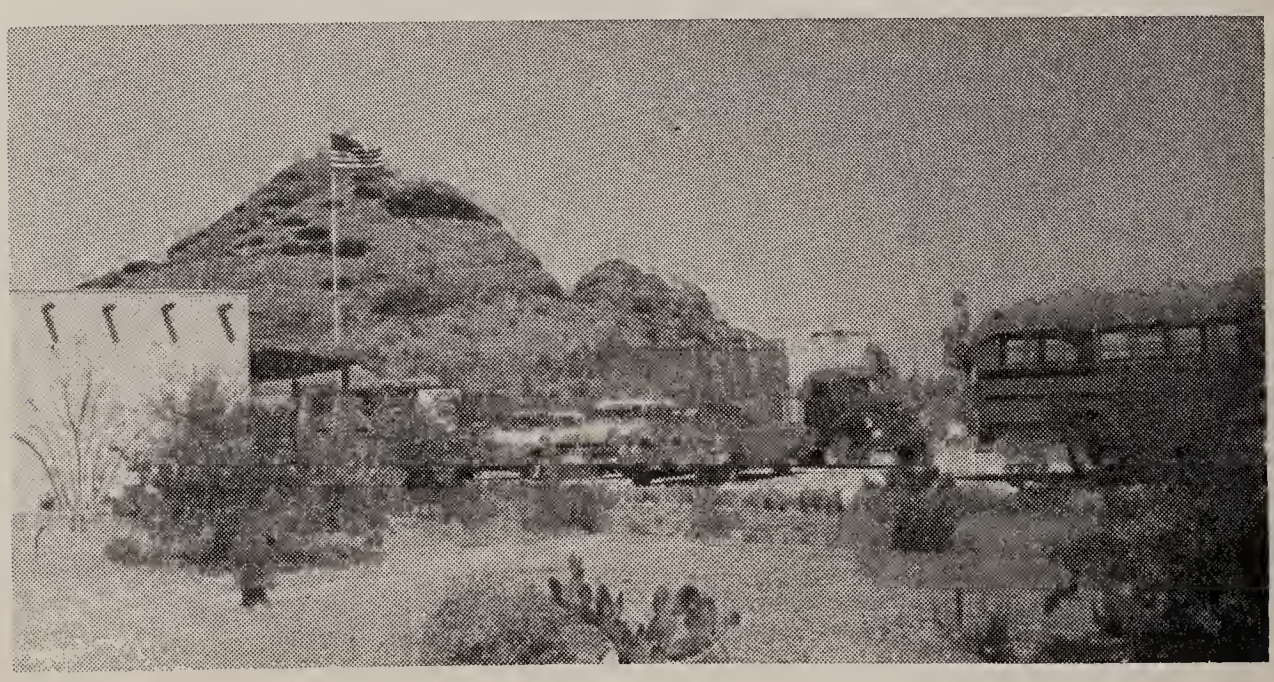
In the background can be seen our 6000 sq. ft. aluminum lath-house that was erected in 1950. This type of lath-house was pioneered by the Garden and has since been successfully used by many nurserymen and botanical gardens.



On this truck are the panels and uprights that will be erected next summer to provide another 4900 sq. ft. aluminum lath-house similar to the one in upper photo. This building will house the leaf-succulent plants only while the older lath-house will be used for cacti.

Construction equipment grading new road through Papago Park and the Garden.

Laying of drainage pipe across road through the Garden.



The new paved parking lot will eliminate dust raised by trucks, cars and buses.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII June-July, 1963 No. 6

Yellow GALLINITA flower of
Mascagnia macroptera 2/3X

REG MANNING

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W. HUBERT EARLE, Editor

Volume XVII | June-July, 1963 | No. 6

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Desert Botanical Garden of Arizona

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Including Week-ends and Holidays

PACIFIC ON PARADE

JAPAN — MANAZURU CACTUS DREAMLAND

Through the generosity of the Garden's Board, your Editor and wife Lois, were fortunate to spend portions of May and June visiting botanical gardens in Japan, Hong Kong, Singapore, Bangkok, Manila and Hawaii and also fly over Formosa, Cambodia, Laos and Vietnam.

Flying in twelve different jet planes at 38,000' elevation and at over 550 miles per hour, one has the opportunity to see a large portion of the Pacific Ocean and its land and islands pass in front of you as though they were on parade.

In the following issues of the Bulletin, accounts will be carried, with photos, of various botanical gardens we visited in the above countries. This issue will highlight the Manazura Cactus Dreamland Botanical Garden which was the focal point of our trip.

Last January, Mr. Tokushiro Kaku, President of the Aska Trading Co., Tokyo, Japan, and organizer of the Manazura Cactus Dreamland, asked Dr. George Lindsay, Director of the San Diego Museum of Science, Mr. Jay W. Dodson, International Succulent Institute, Inc., San Francisco, and your Editor to attend the dedication in late April of the Manazura Cactus Dreamland, a new botanical garden under construction about fifty miles south of Tokyo on the east coast of Japan.

Due to continual winter rains the dedication was later changed to the last of May at which time Mr. and Mrs. J. Dodson and your Editor and wife were on hand for the opening. But sorry to relate the elements were against any ceremony as a great portion of the parking lot had slipped off into the sea and the continual rain gave evidence that a 'dedication' would not be held until the late summer for this outstanding, modernly designed botanical garden.

Under construction are four circular conservatories at the Manazura Cactus Dreamland

Nevertheless, our genial host, Mr. T. Kaku, kept us all busy for ten days with tours of Japan by car, bus, train, plane and cable car. He and his employees, Sigeo Kimura and Tony Uzawa, guided us with a generosity, punctuality and planning of minute details that made the trips most exciting and gratifying to we strangers in a foreign land.

By air, Japan certainly surprised us as being so mountainous, green and its many clear streams running down to the sea. Alluvial fans, soil brought down off the mountains by floods, are few and well developed for agriculture, towns and cities. Many small villages cling to the hillsides while the flat narrow valleys are devoted to agriculture.

Rice was being planted from the 'nurseries' and it is a mystery how the farmers and their wives and children are able to wade through the cold water from dawn to dusk planting, cultivating and tending the tender young plants. Rice can be grown in many other countries of the world where there is ample water and a shortage of food but their peoples do not have the needed patience to cultivate this crop.

Tokyo, the largest city in the world with a population of over ten million persons, is at the present time one of the dirtiest ever visited. This is due to an economic booming explosion of the last decade with business and prosperity on a steady, healthy, daily incline.

The Olympic Games, to start in October 1964, have contributed to a hurried-up demolition program in that vast areas of old buildings have been condemned and a 24 an hour day, 7 days a week works program in the construction of new highways, hotels, buildings, streets and parks have contributed to the present unsightliness of the city. At regular intervals along the downtown streets were great piles of dirt, looking as though they had been pushed up by giant moles burrowing under the streets when actually it is the extension of new subways.

100′ circular, self-supporting, steel and glass domed conservatory for Mexican cactus.

Mr. T. Kaku and Mrs. Earle inspecting details of the interior of the Mexican cacti building.

Hundreds of thousands of persons commute daily in and out of Tokyo from the sprawling urban areas. At these rush hours the street traffic is at a standstill to allow the commuters to get to their stations and are then given only a few seconds to board the fast and efficient moving split-second electric trains.

City traffic is unique as driving is on the left side of the street. Pedestrians are scattered as cars and trucks bear down upon them as indicated on the Tokyo scoreboard which may show 5-6 persons killed, 150-200 injured daily. Drivers in other cities of Japan do not drive with the abandon 'kamakazi' (suicide) spirit as those of Tokyo. It is quite an experience to be whirled through the dizzy traffic in the small, well-driven cars. We were most happy to experience our first auto T.V. in Mr. Kaku's chauffeur driven car. He had a set installed, with excellent reception of the Sumo semi-finals, for our arrival and it caused much 'ogling' from passengers and drivers in adjacent traffic lanes.

Tokyo with its lack of planning is similar to many of the other principal cities of the world in that it is losing its national character and changing into an international city of an unknown character to be determined in the very near future. Buildings are somewhat bold but tend to the 'western.' The present 'face-lifting' may shortly reveal a new identity.

Japan is blessed with abundant rain each year and its cool climate is conducive to the growing of many types of plants. Beautiful botanical gardens are found throughout Japan and its islands and are maintained by cities, industries, schools, universities, shrines and temples. All tropical and arid plants have to be sheltered and grown indoors. So it is with great interest that the people of Japan are eagerly watching for the opening of the Manazura Botanical Gardens.

Here on a narrow strip of land projecting into the sea, in a natural forest of pines and hardwoods, 300′ above the ocean has been constructed four large,

Workmen placing colorful rock in South American cacti building.

ARIZONA POINT OF INTEREST

U. S. highway 89A dropping off Mingus Mountain into the ghost town of Jerome. Verde Valley and colorful Oak Creek Canyon are in the distance. These mountains are honeycombed with over a hundred miles of mining tunnels from which fortunes in copper, silver and gold were removed.

circular steel and glass conservatory buildings each about 100′ in diameter. They are joined together with covered greenhouse corridors that will enable visitors to pass from one building into another in all types of weather.

One building will be planted to tropical plants, another to Arizona and American cacti, another to Mexican cacti and the other to South American cacti. The corridor-greenhouses will house succulent-leaf plants, South African Aloes and minicry plants.

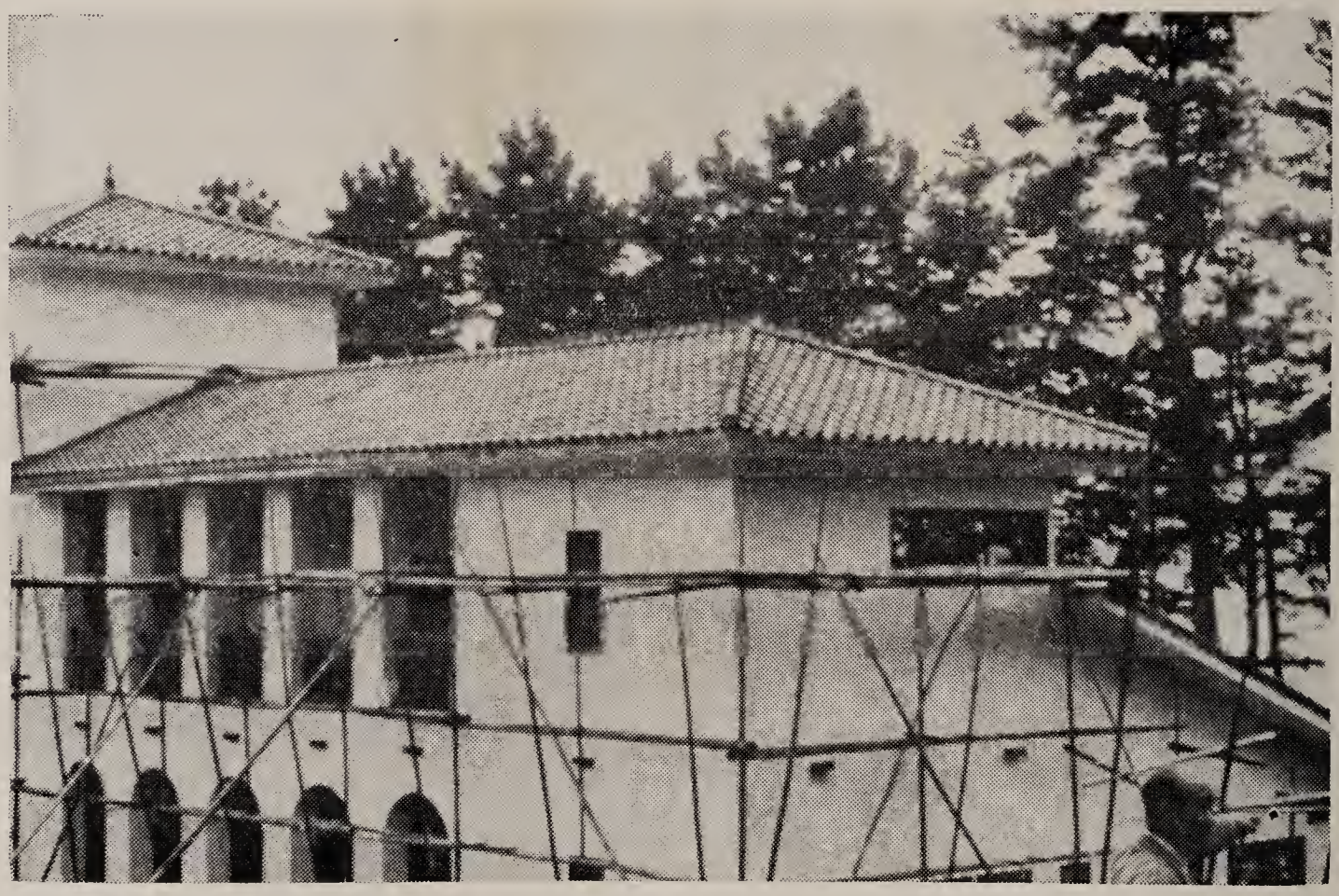
The whole operation has been under the superb guidance of Mr. T. Kaku assisted by President Yoichi Toshimitsu, Director H. Kitakawa (men of means and importance in Japan) and the architect who designed the new Tokyo University Conservatory.

A striking new white, 2 story, blue tiled roof administration building of Mexican influence will contain the cafe, business offices, library and reception room. An aviary is being provided for birds and a pit and island for monkeys. The Garden will be a year-around attraction for tourists and travelers. The inevitable hordes of well-mannered and orderly school children will crowd this Garden daily as visiting points of interest is a great part of the Japanese school system. It is quite common to daily see a convoy of 20-30 busses transporting students to parks, shrines, etc.

In lieu of the dedication, the officials of the Manazura Botanical Garden gave us a very lovely Japanese dinner at the Zangetsu Tea House in the famous Chinzan-So (camellia villa), northwest of downtown Tokyo. Exchanges of gifts and letters were made and the officials were most happy to receive a letter from our Governor Fannin which was as follows:

May 16th, 1963
My dear Mr. T. Kaku:

Through the good offices of the Desert Botanical Garden of Arizona, it is a pleasure to send greetings to you and



Administration offices, Library, Cafe and Visitors are housed in this attractive blue-tiled roof building of Mexican architecture. Note the scaffolding which is of strong yet light bamboo grown in Japan.

Mexican cacti plants 'stored' in the nearby Manazuru Cape Palace Hotel greenhouse.

Mr. T. Kaku, your editor and Mrs. Earle at the Tokyo Cactus Club dinner meeting. Photo by H. Hirao

the other officials of the Manazura Botanical Garden on the occasion of your formal opening on May 30th, 1963.

You have paid a great tribute to Arizona in honoring Mr. Hubert Earle on this occasion, and speaking for the people of Arizona, may I express to you our gratitude. People of this state are indebted to many persons of Japanese descent who are among our most prominent, hard working and industrious citizens.

With sentiments of esteem, I am,
Sincerely Paul Fannin (signed)
Governor of Arizona.

Your editor spoke and showed slides at another unusual meeting of the Tokyo Cactus Club where he was made their first honorary President and presented with a club emblem lapel pin and later a tie clasp depicting a prickly pear.

There is much more should be written but space is limited, but the politeness of the Japanese folks is charming and unlimited. Future issues of the Bulletin will cary additional stories of Japan and the Far East.

MASCAGNIA MACROPTERA MALPIGHIACEAE

GALLINITA

DESCRIPTION:

Mascagnia macroptera grows as a scandent shrub or a twining vine. It may attain the height of two meters in shrub form and five meters where it entwines on other vegetation. The opposed leaves have entire margins and are oval to lanceolate in shape. These are from three to eight cm. long and have a rounded to acute apex. Gallinita flowers irregularly from spring into summer and fall. A pubescent style is attended by ten stamens bearing ovoid anthers. Petals are yellow and measure six to twelve mm. in length. The calyx is glandular and stipules are borne at the base of the petioles. Peduncles are three mm. long or longer. The fruit consists of three samaras with large undulate wings, overall width being from 4.5cm. to 5.5cm. The seed is irregular in shape and up to ten mm. in length.

Flowering branch of *Mascagnia macroptera*

DISTRIBUTION:

Gallinita, while limited in distribution to Mexico, has an extensive yet irregular range. It is found on the Lower California Peninsula as well as in the mainland states of Sonora, Sinaloa, Hidalgo, Nuevo Leon, and Tamaulipas. In Sonora, within the short tree and thorn forests, it is common at the following locations: Alamos, Carimechi, Los Tanques, Mescales, Navajoa, San Bernardo, and Tesopaco. Elevational range of this species is from 50 to 450 meters in valley or arroyo situations.

UTILIZATION:

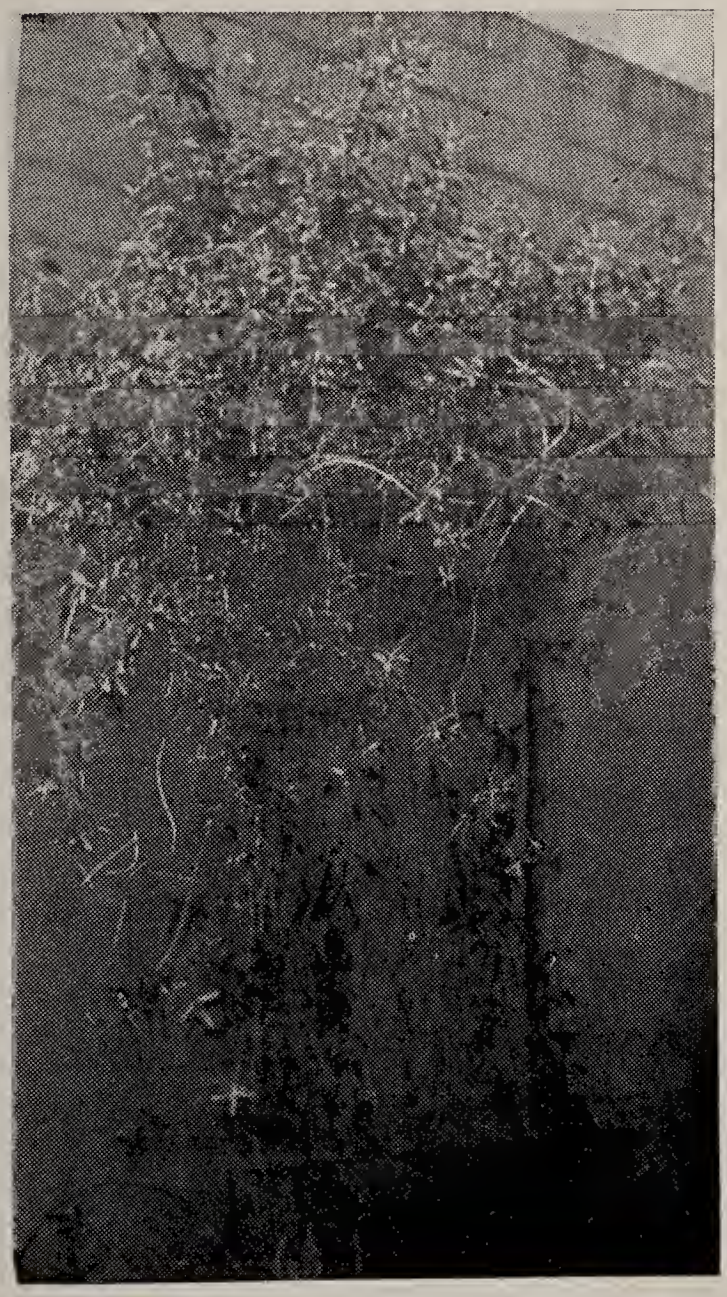
Mascagnia would be a particularly suitable plant wherever a fast growing, perennial, and flowering vine is desired. Tendrils being absent, some structure is required on which it may ascend. A trellis, fence, or even living or dead trees will afford a supporting frame. In addition to the ascending stems, many will extend as runners in all directions from the base of the plant. A profusion of the clear butter-yellow flowers is quite attractive and these may be used for temporary indoor arrangements and floral centerpieces. The large winged fruits can also be used in the above manner.

CULTURE:

A full sun or partial shade location having well-drained soil is suitable. South or east exposures adjacent to structures are desirable in areas where temperatures fall below 25°F. A hard freeze down to 17°F. will damage top growth, but quick recovery is made the following spring and summer. Weekly irrigation should be provided during the active growing season. Heavy mulching with barnyard fertilizer in early spring is beneficial.

PROPAGATION:

Propagation of **Mascagnia** can be achieved by using either seed or cuttings. No pretreatment of the seed is necessary other than extracting it from the wing. Growth rate is slow the first season and rapid thereafter. Best results will be obtained by starting the seedlings in containers and after one season's growth transplanting them where desired.



GALLINITA used as vine against the wall.

GALLINITA used as a vine climbing a dead tree.

REMARKS:

There is a need for a greater variety of perennial vines suitable for landscaping in the warmer areas of the Southwest. **Mascagnia** has demonstrated no objectionable features and should prove to be popular and widely utilized.

REFERENCES:

Gentry, H. S., Rio Mayo Plants; Standley, P. C., Trees and Shrubs of Mexico.

KALLSTROEMIA GRANDIFLORA

ARIZONA-POPPY

ZYPHYLLACEAE

CALTROP FAMILY

An eighteen inch tall *Kallstroemia grandiflora* annual.

A flower of poppy-like appearance except that it has five petals whereas the Mexican poppy (**Eschscholzia mexicana**) and the California poppy (**Eschscholzia californica**) have four petals in the flower.

This striking and one of our most attractive summer annuals of southern Arizona is 1′-3′ tall and fills the ditches and covers the hillsides with its deep dark green foliage with yellow to dark orange blossoms that close in the evening through July and August and into late October if there have been late summer rains or showers.

It is rather weed-like in growth but is a good summer cover crop and has very little forage value due to its rough foliage. It is in the same family as the Puncture-vine (**Tribulus terrestris**) and the creosote-bush (**Larrea tridentata**). There are four species of Kallestroemia growing in the state but **K. grandiflora** is the most prominent, yet it has various forms and flower color.

CONTRAYERBA (**Kallestroemia brachystylis**) is found in New Mexico and the Spanish New Mexicans say that the powdered roots, when soaked in warm water, makes a good wash for sore eyes and swollen gums. Also if taken as a tea it is an excellent remedy for fever, stomach trouble and dysentery.

Flower 2/3X

Fruit and stem 2/3X

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII Aug.-Sept., 1963 No. 7

Staff members erecting new signs at Van Buren St. and McDowell Rd. entrances. Pages 78 and 84 will show additional construction projects of past summer.

REG MANNING

SAGUAROLAND BULLETIN

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W. HUBERT EARLE, Editor

Volume XVII | Aug.-Sept., 1963 | No. 7

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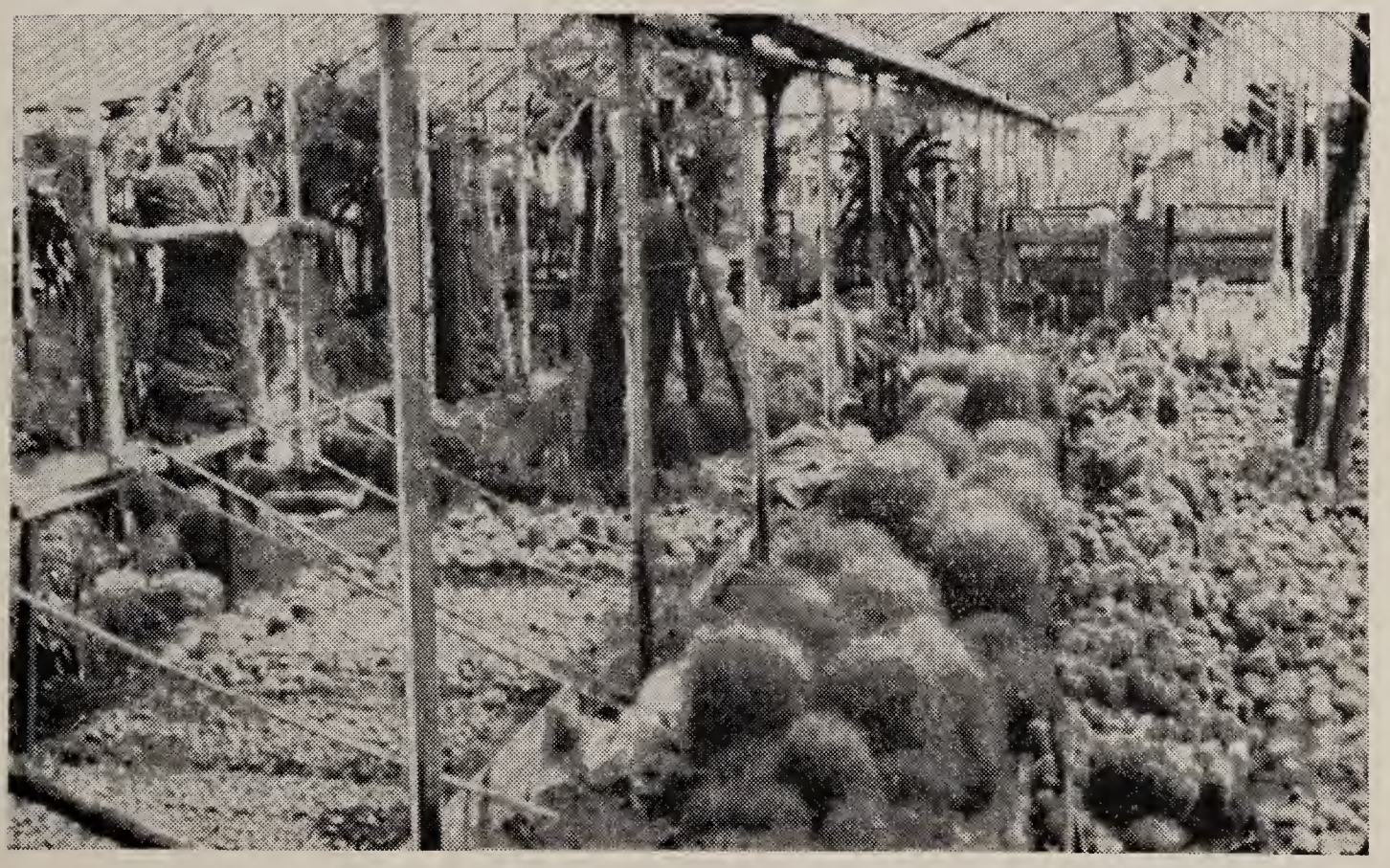
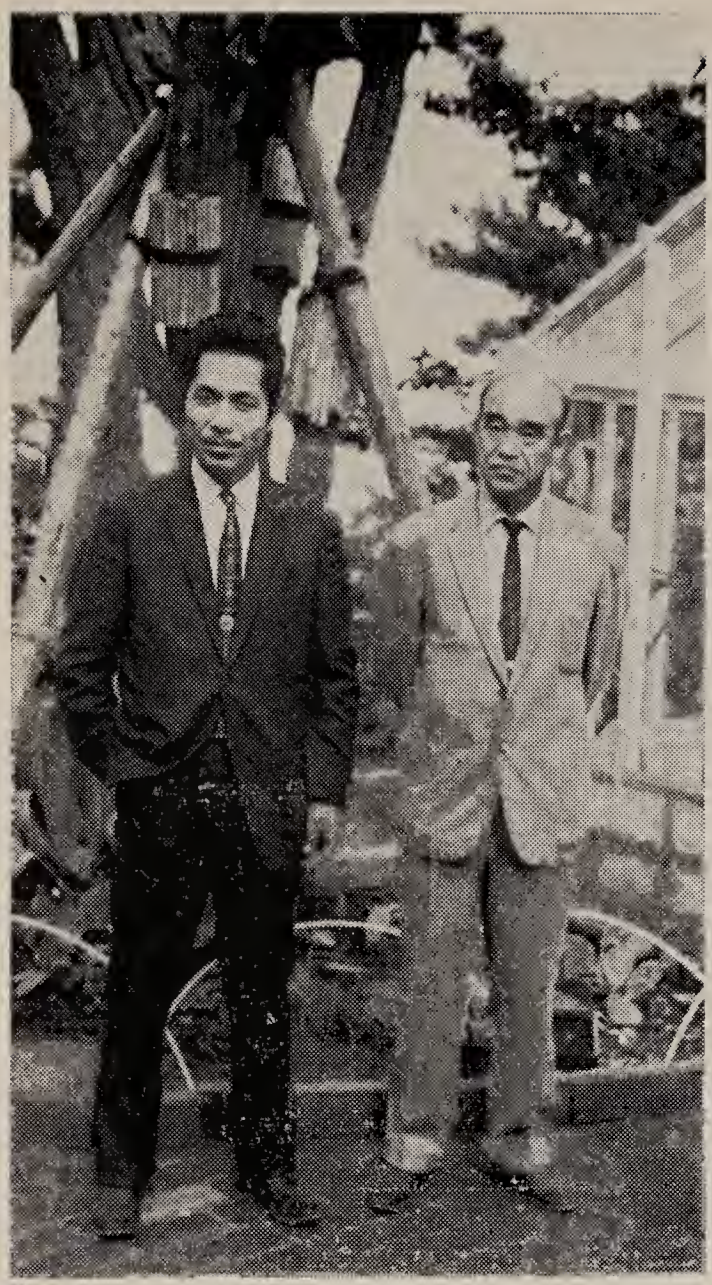
MANAZURU CACTUS DREAMLAND

The ODAKUY NEWS, a magazine issued by the Odakuy Electric Railway, July 29th, 1963, was recently received from Mr. T. Kaku. In it was included a story of the new cactus garden with photographs, some of which are on the following pages. It was certainly surprising how the garden was completed in such a short time after our visit in late May. At that time, the buildings were still under construction, landscaping was yet to follow and plants to be planted in the four large glass and steel conservatories.

Looking down into the Manazuru Cactus Dreamland from the entrance gate.



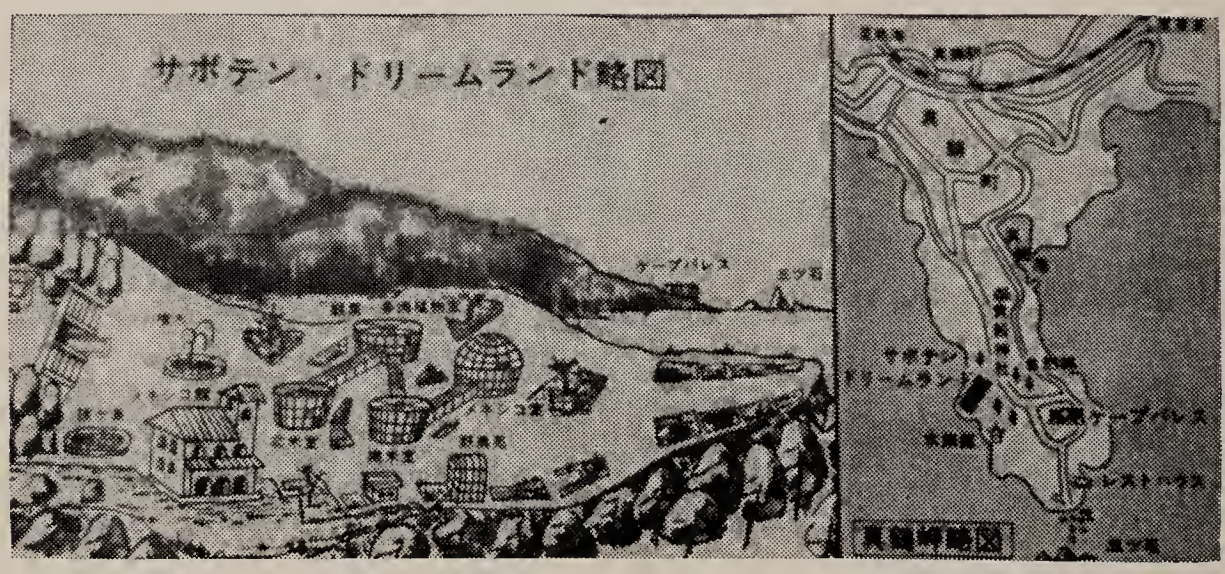
American and Mexican cacti 'stored' in glass house waiting removal to Manazuru Cactus Dreamland. Photo D.B.G.



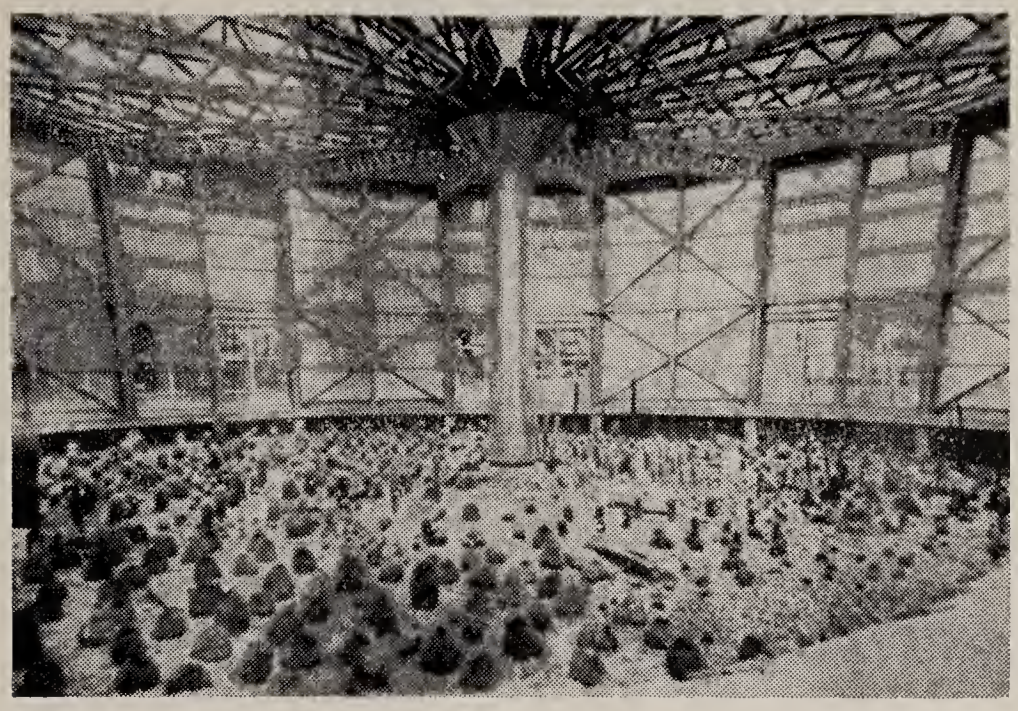
Manazuru peninsula. The Dreamland is located on upper left point several hundred feet above the ocean in a natural wooded area.

Right—Mr. H. Kitakawa, Director Manazuru Cactus Dreamland.

Left—Fernando Kazu Shibusawa, Chairman Folk Culture Assoc.



A 'lay-out' of Manazuru Cactus Dreamland and the peninsula on which it is located.



South American cacti—note the inverted umbrella ceiling of this building. See photo, p.66, June-July Bulletin of workmen preparing rock work within this building.

Mexican cacti and Arizona saguaros. See photo p.65 June-July Bulletin of interior of this building prior to planting of the cacti. This impressive planting is one of the largest in Japan and is attracting a great deal of attention by the many visitors.

PANORAMA OF DESERT BOTANICAL GARDEN

The new Papago Parkway road is shown bisecting the Garden at the left center. It swings along the west side of the Garden from McDowell Road to Van Buren St. and was constructed by the City Parks Dept.

In the center of the photo can be seen the new paved road and parking lot constructed by the Garden in June at a cost of $5,042.

Arrangements are being made with the City Parks Board to exchange the Garden land, in lower left of photo, for City Park land partially shown in lower right. This will then make the Papago Parkway our west boundary.

ARIZONA POINT OF INTEREST

Oak Creek Canyon is a beauty spot of the west located 20 miles south of Flagstaff and extending southwardly 15 miles to Sedona. The high sandstone and limestone cliffs are vivid in color throughout the year but more so during the fall months. The creek abounds with Rainbow Trout and during the fishing season is crowded with expectant nimrods.

PAPAGO PARKWAY PROGRESS

Construction equipment building up the road through Papago Park in April.

Road completed in early June. Traffic is now quite heavy and has aided in the depletion of our large destructive jack-rabbit crop. A parallel road is being planned for the future then making one-way traffic on each road.

City Councilwoman Mrs. Edna McEwen removing tape from signal lights to signify the opening of the new Papago Parkway August 10th.

Councilmen Jay Hyde and Dr. Ray Pisano moving the 'Road Closed' sign and City Traffic Engineer C. E. Haby removing barrier to allow traffic to use new road. This road has been a dream of the City Parks Dept. and the Garden for many years. It will enable motorists an easier access to the Garden, Phoenix Zoo and Hole-in-Rock picnic area.

ACACIA WILLARDIANA Rose — FAM. LEGUMINOSAE

Palo Blanco

Palo Liso

By John H. Weber, Horticulturist

Acacia willardiana in bud and blossom. ½X

DESCRIPTION:

ACACIA WILLARDIANA in form is a small to medium sized tree attaining a maximum height of about eight meters (26 ft.). Trunk in diameter seldom exceeds 15 cm. (6 in.) and branches low to form a spreading open crown with long trailing unarmed branches. On the main trunk and primary branches, the yellow or yellowish-white bark peels and curls, exfoliating in thin papery sheets. The leaves are more typical of the Australian acacias than those of the New World. The persistent petiole is 10 to 20 cm. long and flattened into a phyllode which takes on the form and functions of a leaf. In seedlings and on new growth the long drooping leaves have from one to three pinnae. Leaflets are pale green, measure 2 to 6 mm. in length, and are soon deciduous. In the Spring and early Summer months, flowering occurs with pale-yellow or white spikes; these ranging from 3 to 6 cm. in length. Fruit consists of a flat glabrous pod 8 to 15 mm. wide. The thin pod contains a few round seeds, 10 to 12 mm. in diameter. These are thin and flat and quite frequently infested with a small weevil. Plants commonly in association are Bursera sp., Jatropha sp., and Agave yaquiana.

DISTRIBUTION:

Palo Blanco is found growing predominately on rocky slopes and on the crests of ridges and arid hills. In elevation, it ranges from sea level to 950 meters (3,000 ft.) in the thorn forest. Rocky soils of volcanic origin are the rule. Just north of Guaymas, Sonora it is common, growing in jumbled piles of malpais boulders.

This species is limited to the state of Sonora and the Baja California peninsula of Mexico. It extends south on the Sonoran plains from the Rio Sonora on the north, to its southern limit on the lower Rio Mayo.

Fruit pod of *Acacia willardiana*

UTILIZATION:

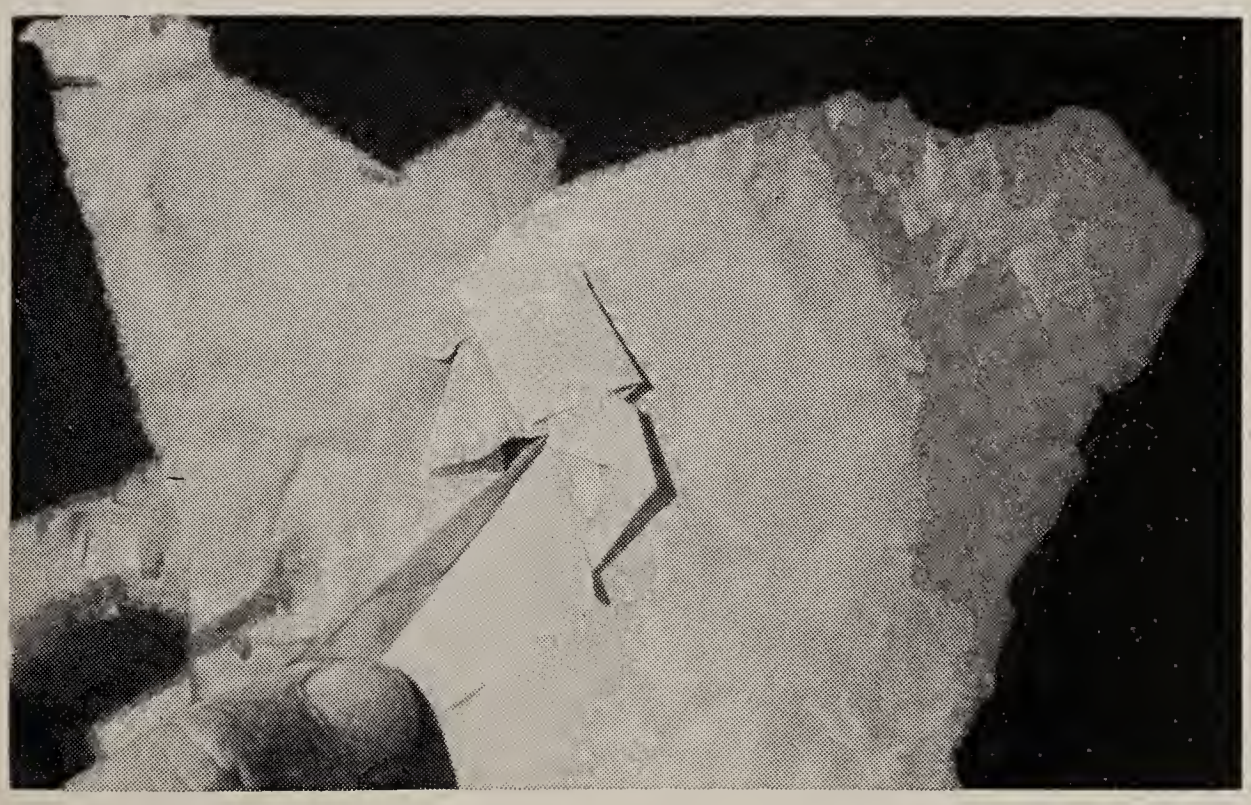
As an ornamental tree, ACACIA WILLARDIANA is desirable for the weeping habit of its graceful pendant branches. It would be particularly useful where the desired effect is that of a Japanese garden. Having no thorns, it is suitable as a patio tree or for raised beds and planters adjacent to houses or buildings. The white exfoliating bark makes this species excellent for Bonsai treatment.

CULTURE:

Palo Blanco is very drought resistant, seldom requiring additional watering even in areas having only five inches of annual precipitation. This plant will do well on poor soils providing they are well drained. Under cultivation, growth is rapid resulting in a slender trunk requiring support until the stem caliper is sufficient to hold the crown upright. Palo Blanco has wide limits of temperature tolerance; having withstood a low of 17 F. without incurring damage and highs up to 115°F.

PROPAGATION:

Germination is rapid under conditions where temperature is in the 70° to 80° F. range. Growth rate is fast producing a



Pear-thin bark off the trunk of *Acacia willardiana*

flowering tree with three years growth. The seed coat is impermeable and must be scarified to allow penetration of water. Soaking the seed overnight in water that has been brought to the boiling point will also break the impermeability. Seedlings can be started in small pots and then transferred to larger containers or installed directly in place. Seed should be fumigated if it is to be stored.

REMARKS:

Having all of the attributes of many of the Australian acacias, Palo Blanco has proven more cold hardy for areas in southern Arizona. A rapid growth rate and pleasing appearance makes it a desirable ornamental tree.

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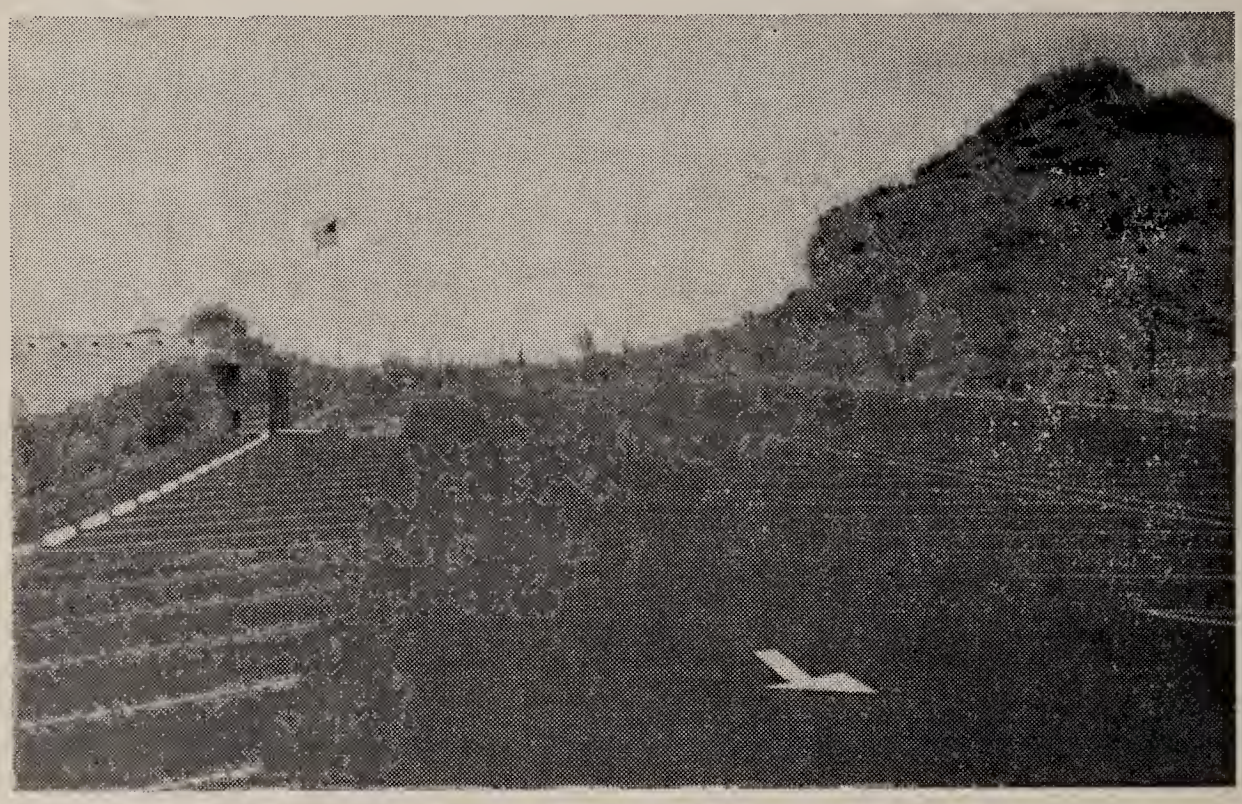
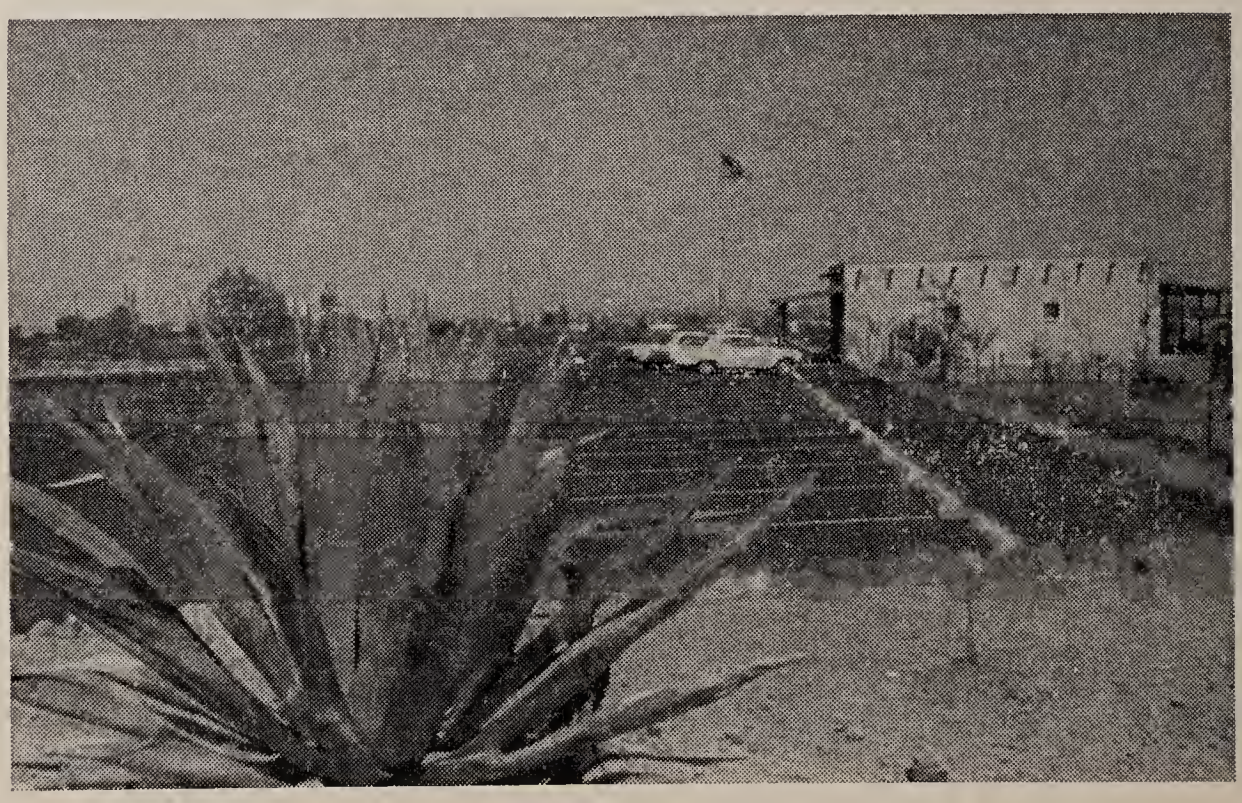


New paved parking lot adjacent to Visitors Building.



Parking lot, looking east, will hold 200 cars.

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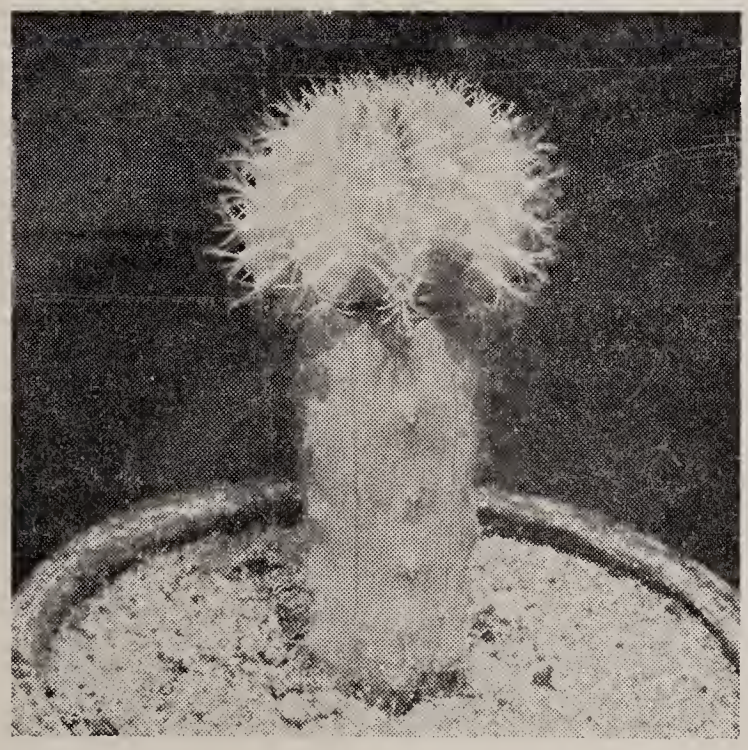

A red, grafted *Gymnocalycium mihanovichii* photographed and grown by Masay Mizohuchi. This form was developed in Nagayo. The Japanese name HIBOTAN means 'red bottom.'

REG MANNING

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PACIFIC ON PARADE: NAGOYA-HIGASHIYAMA BOTANICAL GARDEN

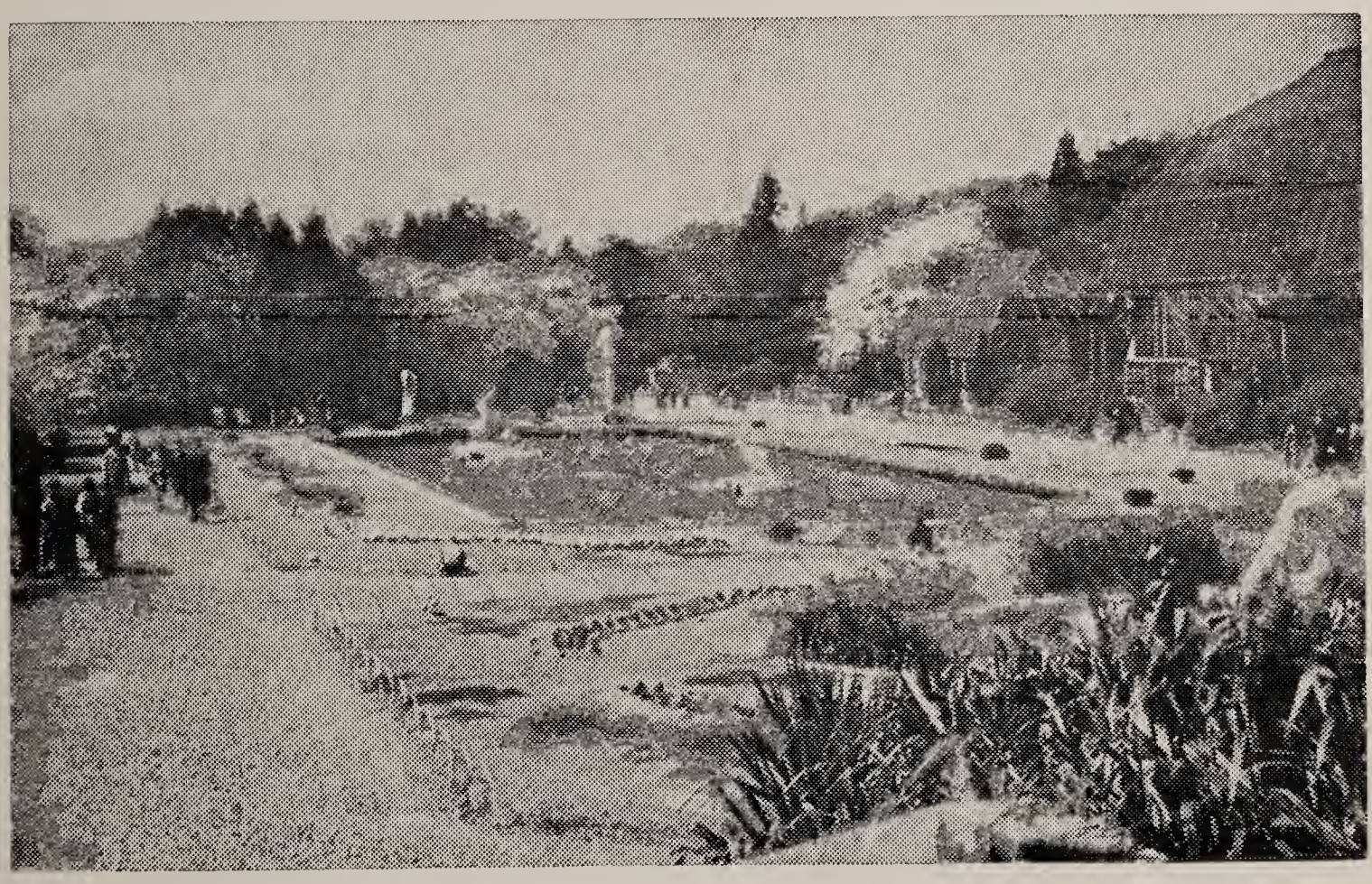
Nagoya is Japan's third largest city with a population of over 1,500,000 situated 225 miles west of Tokyo. Under a vast new city development plan its wide streets, tall buildings, shopping areas, parks and playgrounds have made it the most modern 'laid-out' city in Japan in the last two decades.

Atsuta Shrine, Takugawa Art Museum and the Nagayo Castle contain many of Japan's sacred artifacts dating back to ancient times.

Four miles east of downtown Nagoya is located the Higashiyama Botanical Garden in a hilly natural woodland opened to the public in 1937 and consists of 33 hectares (81.5 acres). It has been under the guidance of Director Koichi Mizuno who this year will be eligible for retirement. Also included within the Gardens are a Municipal Zoo, boating pond, children's play area and large picnic grounds.

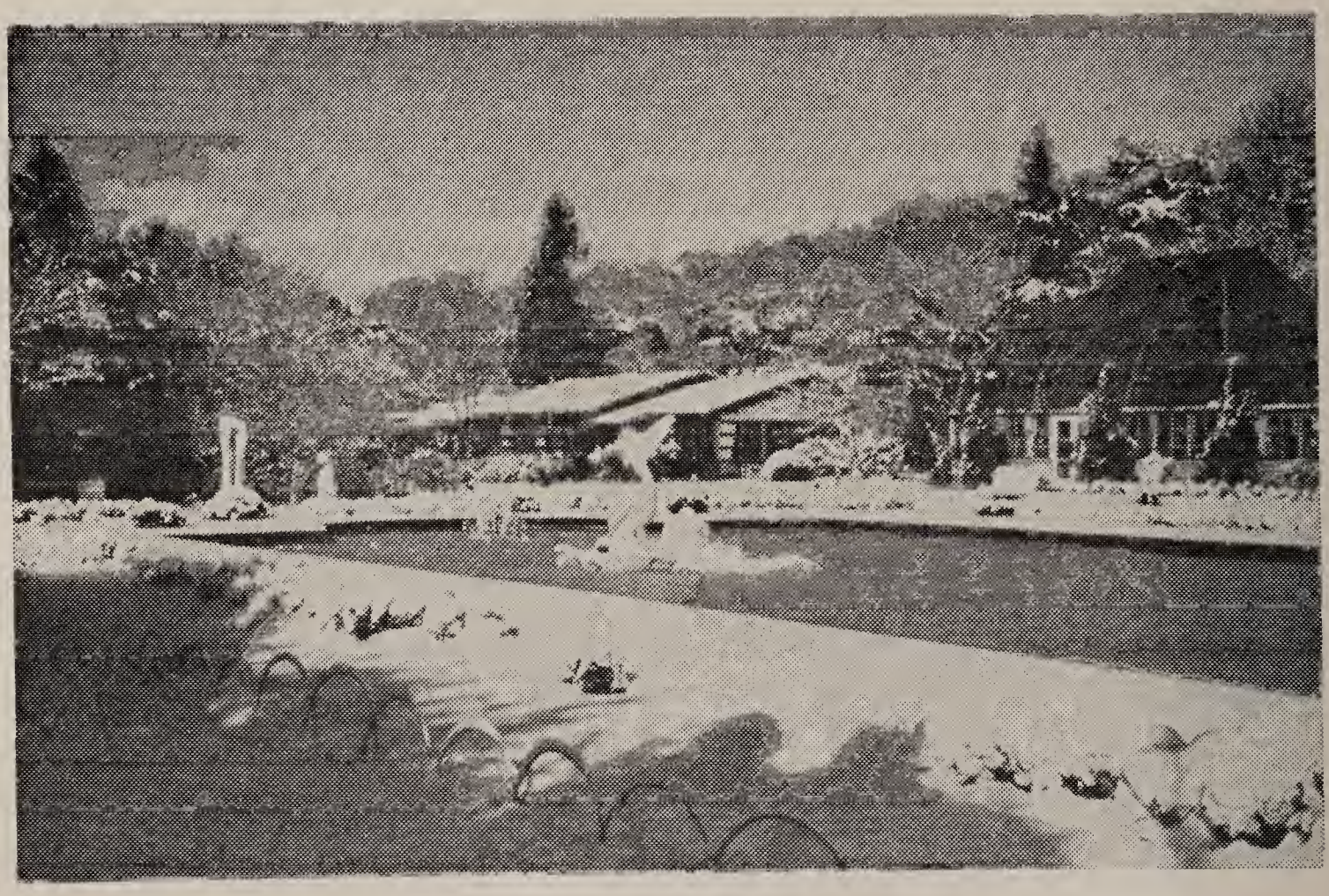
The Gardens are noted for their spring displays of plum, cherry and azaleas blossoms, summer pansies, roses and water lilies and the fall crimson foliage. In addition other features of the Gardens are conservatories for tropical plants and cacti, Yaya, camellia, larch, bamboo, rock, American and desert gardens—the latter was built with our suggestions and plants in 1959.

An unusual feature is the Gassho-zukuri House situated above the main part of the garden on a hillside. This family house, 33′ high, 70′ long and 35′ wide was built in 1842 and recently moved piece-meal from Omaki about 80 miles north of Nagoya. The house is built entirely of logs and boards held together with straw ropes without the use of nails or clamps. The 60 degree sloped roof is thatched with an 8″-12″ thickness of grass.



Attractive formal pool with sculptured birds. Glass conservatories to the right.

It was raining the day your editor and wife visited this spacious garden.



A typical winter day in the Higashiyama Botanical Garden.
Administrative office center, rear.

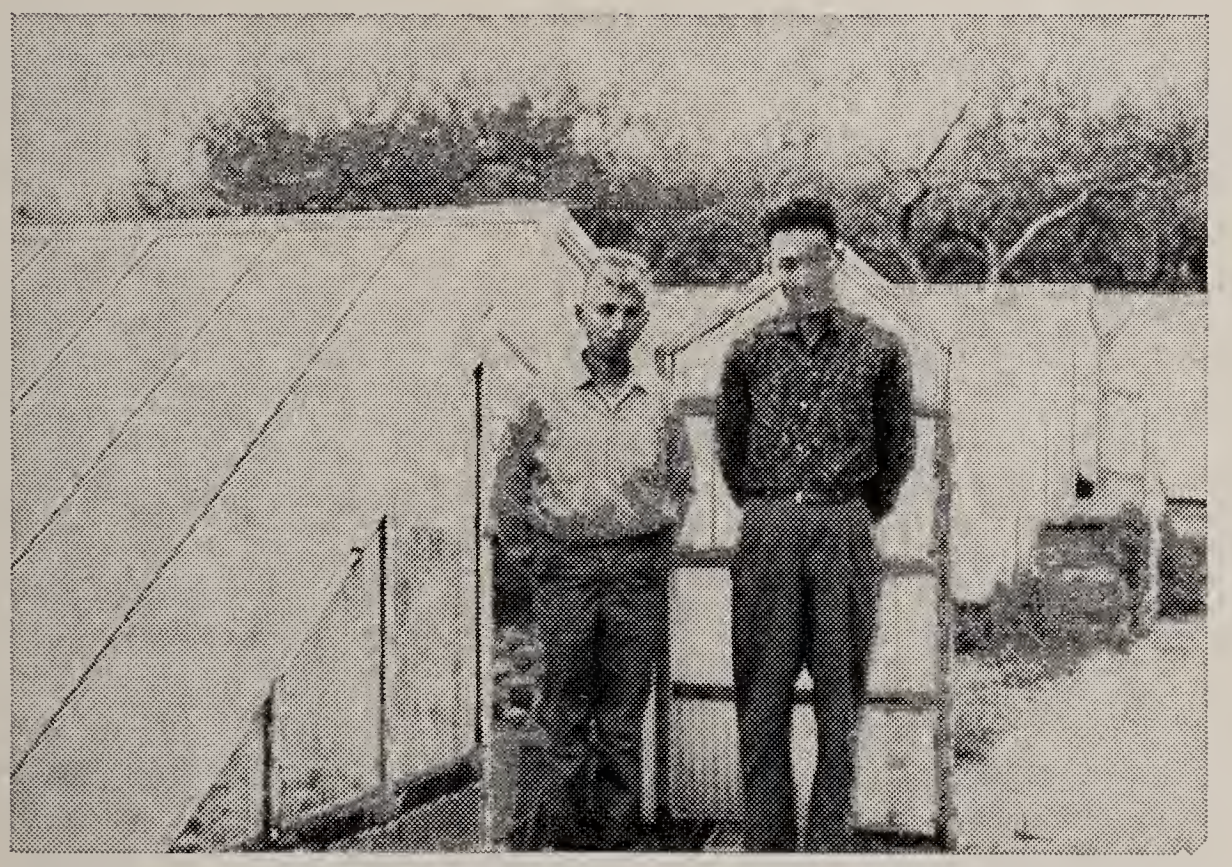
Director Koichi Mizuno and his charming and well informed wife.

A family of 40-50 persons inhabited this dwelling in a mode of living that has now disappeared due to Japan's rapid industrial growth. The origin of this large family system has been lost in obscurity.

Nagoya is famed for its many apple orchards but in the past few years many of the growers have begun to build low glass houses in the orchards for the propagating of cactus seedlings from seed received from United States, Mexico and South America.

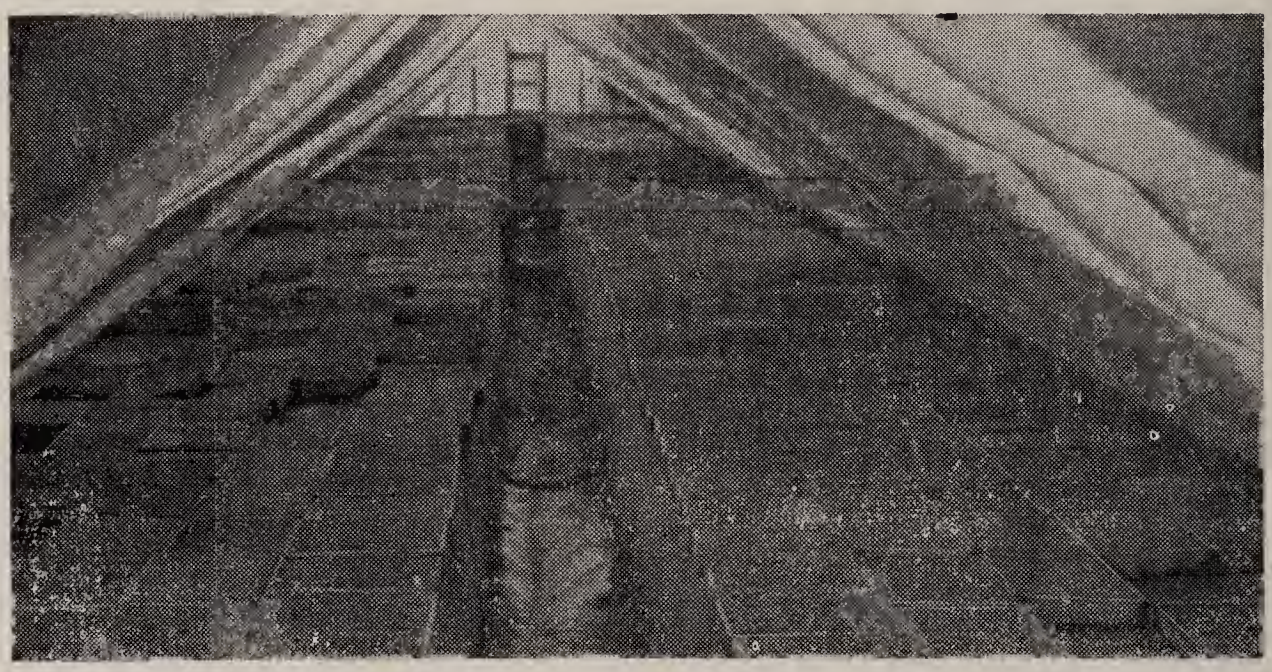
There are now twenty-six Nagoya cactus nurserymen who are doing an excellent job of raising seedlings and cactus plants for the large Japanese market and they are beginning to export surplus seedlings to other parts of the world including U. S. A. Their patience and low labor costs will enable them to compete with our American cactus growers.

Mrs. Earle and your editor were most fortunate to be shown through many of the nurseries by Mr. T. Kaku of Tokyo and Masaya Mizokuchi, a local newspaper editor and ardent cactus fancier.



Two of Nagoya's Cactus Nurserymen. Notice how you step down into the low glass-houses.

A typical Nagoya glasshouse filled with cactus.



Millions of healthy cactus seedlings.

Private collection of Masaya Mizokuchi, Nagoya

ARIZONA POINT OF INTEREST

SANTA CATALINA MOUNTAINS are located a few miles north of Tucson. The early Spanish referred to them as 'La Iglesia'—"The Church" due to their resemblance of a large cathedral. Sabina Canyon, at the base of the mountains, is a popular recreational sport. Highest point is Mount Lemmon 9150'. A good paved road starts in the desert and ends in the pines.

Rows of 18th month old Golden Barrels *(Echinocactus grusonii)*.
Compare thier size with pen, center, bottom.

HIBISCUS TUBIFLORUS — Family MALVACEAE

By John Weber, Horticulturist

DESCRIPTION:

HIBISCUS TUBIFLORUS is a slender open shrub to 1.8 meters in height. The leaves are 2 to 5 cm. long, 3.5 to 4 cm. wide, and are beset with stellate bristle-like hairs. In shape, the leaf is deltoid-lanceolate or deltoid-ovate; the base being subcordate, and the apex is acute or obtuse. Leaf margin is coarsely crenate-dentate. Flowering is nearly continuous during the summer months. Petals are red and five in number, measuring 2.5 to 3.5 cm. long. The calyx is 6 to 15 mm. long and is subtended by linear acute bractlets. Stamens are numerous and united to form a column. Fruit consists of a dry dehiscent capsule set with stiff rough bristles. The black seeds are 4mm. long and covered with minute hairs.

DISTRIBUTION:

This species of Hibiscus ranges from southern Florida to Mexico, Guatemala, and the West Indies. In Mexico it extends from Tamaulipas to Yucatan, Tabasco, and Chiapas. In San Luis Potosi it is common from Huizache to Cd. del Maiz.

Blossom of *Hibiscus tubiflorus*
2/3X

2′ tall plant of *Hibiscus tubiflorus*

UTILIZATION:

HIBISCUS TUBIFLORUS is adaptable for use as a container or tubbed plant. Its free flowering habit and long flowering period make it particularly desirable. This species also could be used for foundation planting, either employed singly or in groups.

CULTURE:

Being frost tender, a protected site on well-drained soil should be selected for HIBISCUS TUBIFLORUS. When temperatures fall below 30°F. the plant freezes back to ground level, but quickly recovers in the spring to flower again the following summer. Light nitrogen fertilization will promote vegetative growth.

PROPAGATION:

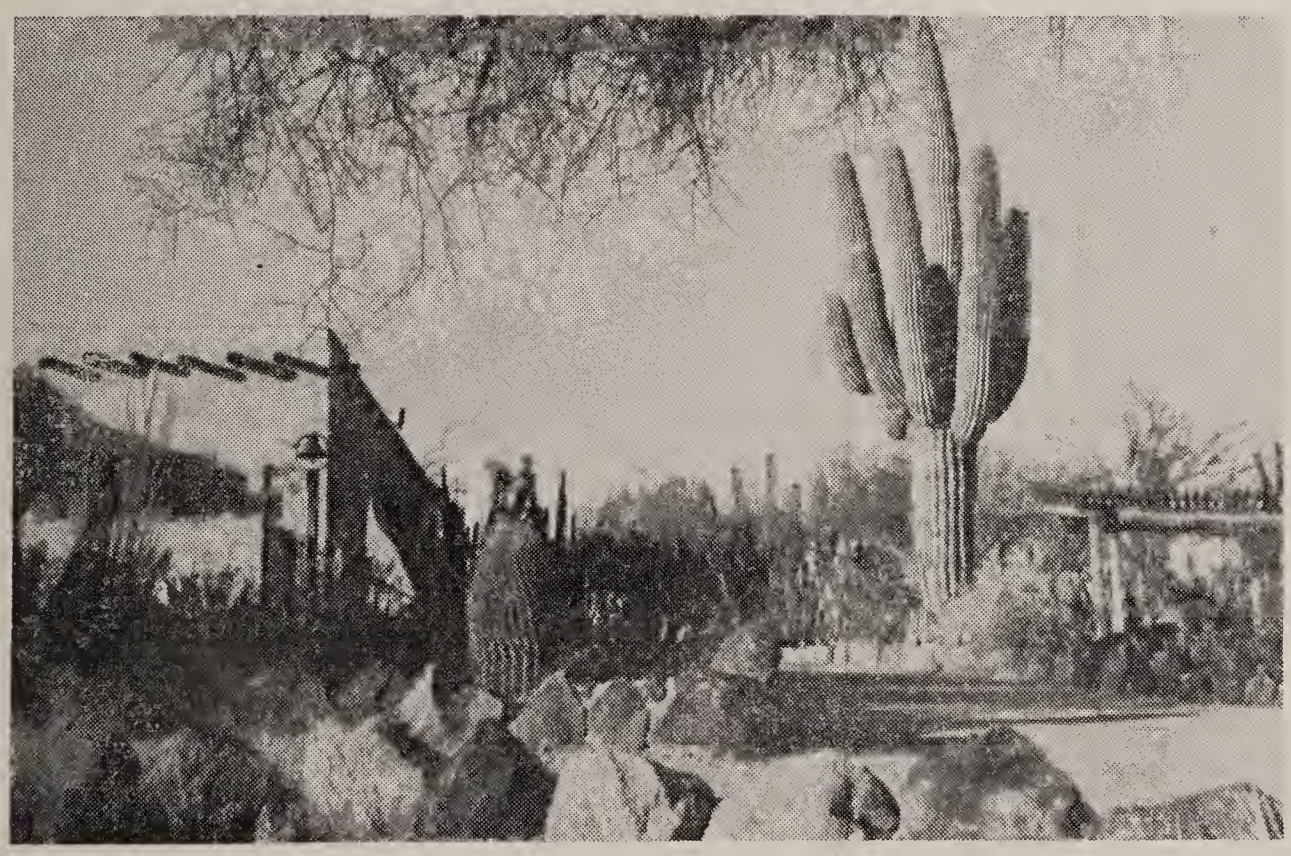
No pretreatment of the seed is necessary for germination. Best results are derived by starting seedlings in containers and allowing one year's growth before planting direct in the ground. Germination is rapid at temperatures ranging from 75°F to 90°F., but growth rate is slow.

REMARKS:

HIBISCUS TUBIFLORUS is not grown commercially, and yet with availability it could be in widespread use as an ornamental shrub.

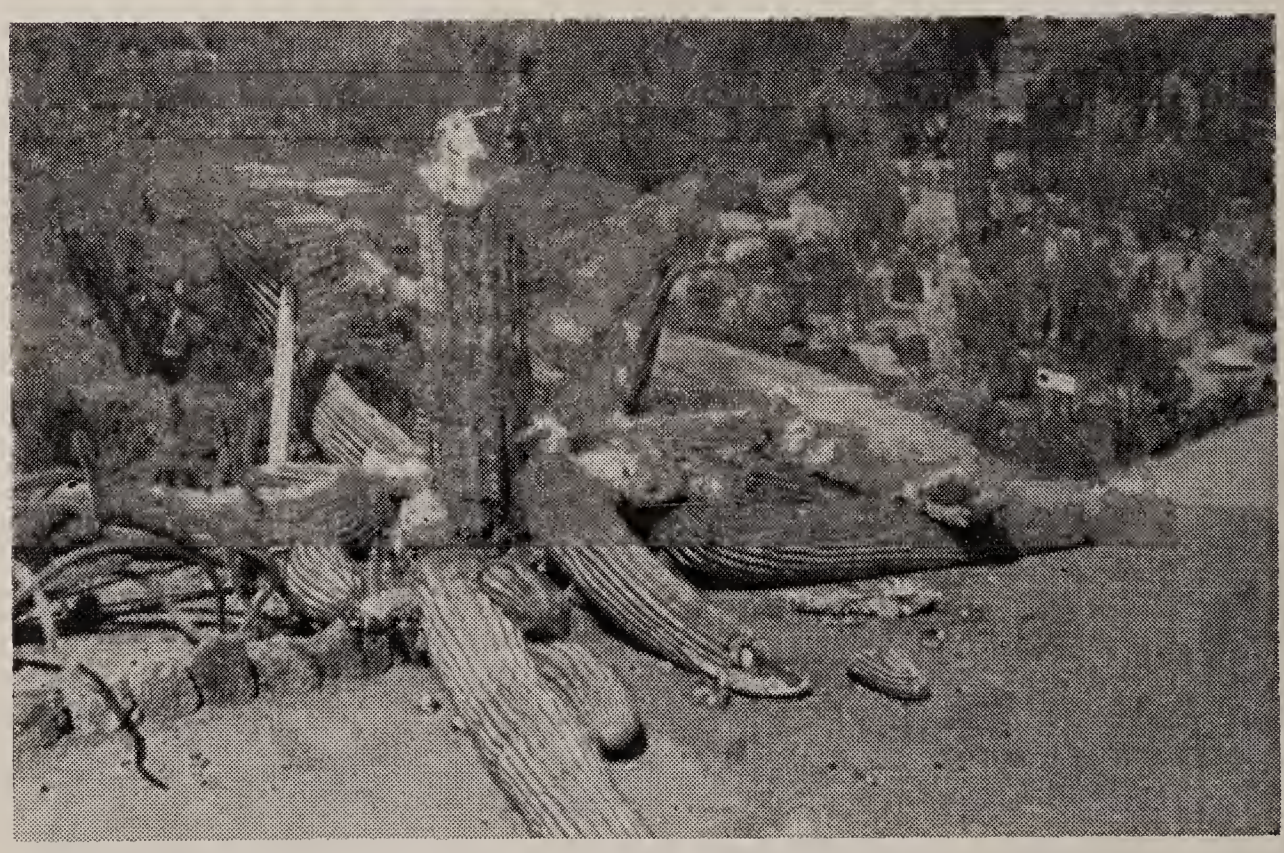
REFERENCES:

Standley, Paul C., Trees and Shrubs of Mexico.



Turn to next page to see what happened to the Saguaro.

180 year old Saguaro *(Carnegiea gigantea)* was shattered by electrical disturbance as lightning hit at edge of building Sept. 1st.



26′ tall Saguaro was quite turgid due to late summer rains. 1′ cross-sections of the arms weighed 94 pounds. This is the third Saguaro the Garden has lost in the last 20 years due to assimilating too much moisture from rains and watering of adjacent plants.

CUCURBITA DIGITATE
COYOTE-MELON

CUCURBITACEAE
GOURD Family

While motoring in the fall, your curiosity may be aroused by the yellow soft-ball size fruits seen in the ditches along side of the highways. These fruits are actually a round form of a cucumber or gourd, although non-edible to humans, they are sometimes eaten by cattle and horses who first crush the fruit with their hooves to get through the tough rind.

These gourds are coarse herbs bearing long, up to 50′ or more, trailing stems emerging from a large elongated tuberous root. Small, unisexual flowers are light to dark yellow from June until late October at desert elevations up to 4500′.

Cucurbita digitate (L. "divided like fingers of a hand") is found in southwestern New Mexico to southeastern California and northern Mexico and is of no apparent value.

Cucurbita foetidissima (L. "most fetid" —evil smelling) is quite similar to the above gourd except for larger triangular thick leaves and is found in Arizona up to 7,000′ in good soil. It blooms from May to August and is found from Missouri to California with edible, globose fruit, which when cooked or dried were relished by the Indians. They also ground the seeds and made a mush.

The above roots were used by the Indians of New Mexico to wash clothes but all particles of the fruit had to be rinsed off the clothes otherwise the wearer developed a rash.

Both of the species are quite attractive around desert homes and lend a dark green ground cover until fall then they are bare during the winter months. They can be started from seed or 'move-in' a tuber from some area that is going to be sub-divided.

15′ long trailing vines extending in all directions from tuber of *Cucurbita digitate*. Notice the 'digitate' (finger-like) leaves of this plant.

An exposed section (4″ high and 8″ wide) of the tuber *Cucurbita digitate* showing several vines emerging from its apex. This tuber extends about 10″-12″ into the ground.

GARDEN ACTIVITIES FOR OCTOBER

1st	8:00 P.M.	Cactomaniacs, Slides—Japanese Gardens. (Auditorium)
2nd	8:00 P.M.	Lecture to Howard Gates Memorial Cactus Club. Title & Trust Bldg., San Bernardino, Calif.
7th	7:00 P.M.	Lecture to Scottsdale Kiwanians, Westward Ho Hotel.
16th	8:00 P.M.	Lecture to Los Noches Women's Club, Tempe.
17th	10:00 A.M.	Field trip Campfire Girl Leaders, Mitchell Lodge, Phoenix.
20th	10:00 A.M.	Executive Board meeting with Pioneer Arizona Foundation.
22nd-28th		Trip to Rotan, Texas, for Bookstore.
30th	7:00 A.M.	Lecture to North Phoenix Optomists, Amsterdam House.

GARDEN ACTIVITIES FOR NOVEMBER

5th	8:00 P.M.	Cactomaniacs, Slides—Gardens of Hong Kong. (Auditorium)
6th	3:00 P.M.	Class—Deserts, How Formed and Their Plants. (Auditorium)
7th	3:00 P.M.	Lecture—Arizona Cacti in Bloom. (Auditorium)
13th	3:00 P.M.	Class—Desert Succulent Plants. (Auditorium)
13th	7:00 P.M.	Lecture to Boy Scout Explorer Post #265, LDS Ward 14th.
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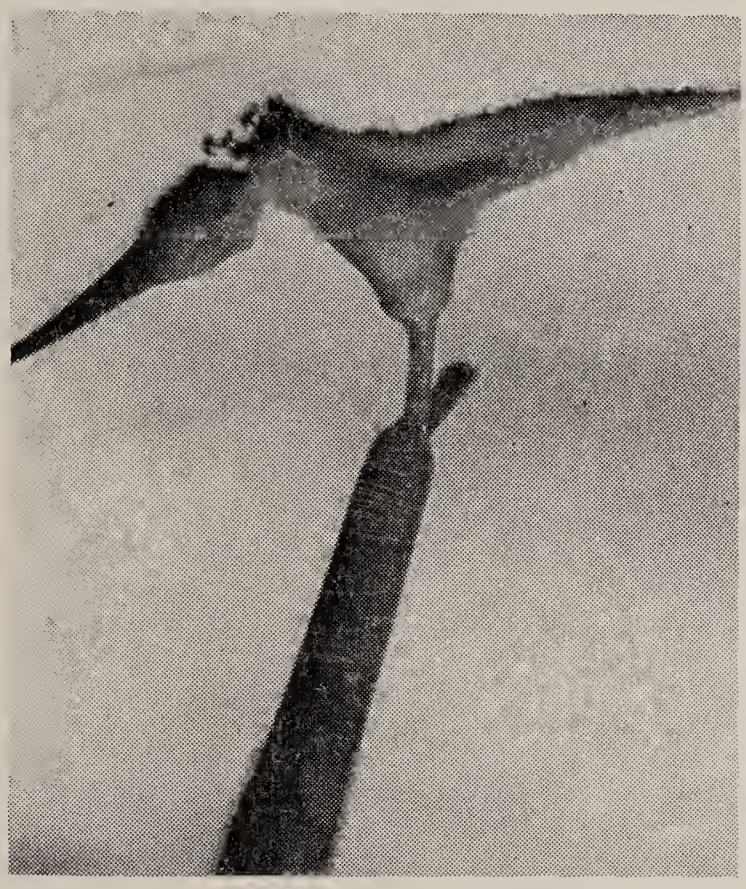
27th	3:00 P.M.	Class—Identification of Arizona Trees and Shrubs. (Auditorium)
28th	3:00 P.M.	Lecture—Birds and Animals of Arizona. (Auditorium)

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII November, 1963 No. 9



Slipper-flower plant *(Pedilanthus macrocarpus)* in flower, 1X.

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVII | November, 1963 | No. 9

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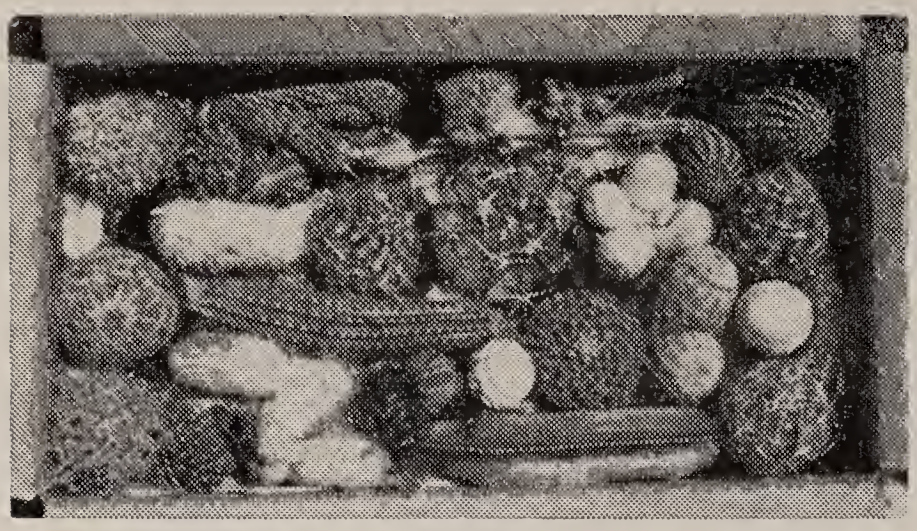

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Pacific On Parade - Hong Kong - Victoria Botanical Gardens

Hong Kong is a most interesting British Colony, situated in the South China Sea, of about 400 square miles with a population of over three million persons and includes Victoria Island, Kowloon Peninsula and the leased 'New Territories' that border Red China and hundreds of adjacent islands.

Hong Kong (Chinese—'Enchanting Harbor') can accommodate the largest ships afloat and its typhoon shelter is a floating city of thousands of sampans and junks, the latter sometimes having three generations living within its teakwood hulls.

Kowloon, on the mainland across from the straits from Victoria City, is quite oriental with a 99% Chinese population plus many small shops, crowded tenements, colorful laundries suspended

Victoria City with 'The Peak' in background.

Edge of downtown Kowloon—note the refugee makeshift dwellings on roof of center building.

over the narrow streets on bamboo poles, cooking and drying fish odors.

Many refugees have slipped into Hong Kong from Communist China causing a tremendous housing shortage. The government has erected many block-long 16 story high apartment buildings where refugees with a family of five or more may rent a 10′ x 12′ room for about 32 Hongkong dollars ($8—U. S. A.) or more per month. Lights and running water are furnished but there are no elevators.

It is quite heartbreaking to see the thousands of refugees living in make-shift shacks of tin, boards and cardboard on the hillsides, under bridges and even on the tops of downtown buildings. All are waiting for jobs and the chance to get into apartments.

Rainfall has been below normal for the past 4-5 years. The water reservoirs are dried up and drinking water was being rationed one hour a day during your editor and wife's visit. Later it was reduced to one hour each fourth day. No water is wasted and much is imported by ocean tankers from Red China.

Winding paths and ramps through the Victoria Botanical Garden.

A portion of the attractive Victoria Botanical Garden overlooking Victoria City and the large harbor.

Despite this acute shortage the people and their clothing were clean.

As Hong Kong continued to expand in the middle 1800's it leased from China the 'new Territories' in 1898 for 100 years. This area of about 350 square miles, is the Colony's main agricultural section and extends to now the Red Communist border. Many questions are now arising as to what may happen to this section when the lease comes up for renewal in 1998.

Victoria Island rises to 1800' above sea level and its peaks are covered a great deal of the time with clouds. Halfway up the north side of island is located VICTORIA BOTANICAL GARDEN overlooking the magnificent harbor and the mainland.

This is a very beautiful garden used extensively by the public. The lack of rainfall for several years has eliminated many plants and only the hardiest are surviving. Grass and small blooming plants are practically non-existent. The moisture from the clouds plus seepage from the rocky island structure has helped the larger trees to stay green and bloom.

The Garden, since it is located on a hillside, has many long stairways and ramps winding through it. The formal pools, collonades, band-stand and shelters lend a pleasing and restful charm. Trees, shrubs and plants are all identified with markers in Latin and English. Dwellings, apartments and schools climb above the Garden to Victoria Peak. The temperatures here are slightly more comfortable than those at sea level; summer average is about 85 degrees, winter average about 70 degrees and the nights are cool. These temperatures are quite favorable to many of the shrubs to exist with a low rainfall. We did not see any water sprinklers in operation while in Hong Kong. From recent letters we learn that the fall typhoons were 'light' and that water will still be rationed.

Botanical Garden greenhouse which houses leaf succulen s and cacti. Notice the scant foliage on the trees and the dried grass due to drought.

A border of large yellow fragrant Frangipani trees *(Plumeria aurea)*. These trees were flowering despite the shortage of water.

GARDEN ACTIVITIES FOR NOVEMBER

5th	8:00 P.M.	Cactomaniacs, Slides—Gardens of Hong Kong. (Auditorium)
6th	3:00 P.M.	Class—Deserts, How Formed and Their Plants. (Auditorium)
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ARIZONA POINT OF INTEREST

SUNSET CRATER is a National Monument located 14 miles northeast of Flagstaff on Highway No. 89. This large cone-shaped crater of volcanic cinders is capped by lighter colored cinders giving its apex a sunset appearance. An interesting ice cave is situated at the southern base of the crater. A large flow of black lava borders the road into the Monument.

PEDLIANTHUS MACROCARPUS Be nth. EUPHORBIACEAE
CANDELILLA SLIPPED-FLOWER Family

By John H. Weber, Horticulturist

A specimen *Pedilanthus macrocarpus* 5′ tall and 6′ foot wide growing in the Garden. Note the many fasciated stems.

DESCRIPTION:

Pedilanthus macrocarpus grows as an erect or semilprocumbent shrub attaining a height of 1.5 meters and a width of 2 meters. It is a multiple stemmed plant with shoots round in cross section arising at ground level then rebranching. These perennial stems measure 1 cm. in diameter and are gray-green in color. Many stems develop fasciated growths which results in a number of irregular forms giving the plant on overall strange appearance. A member of the Euphorbia family, it has a milky latex-like sap, and is the only species of the family in North America having a high degree of succulence. There is an alternate arrangement of the leaves, these being small and soon deciduous. Flowers are borne at the shoot tips beginning in May and continuing until October. The ultimate inflorescence division is carmine to red in color and shaped like a shoe or slipper,

An 8 month old seedling and a dried fruit of *Pelidanthus macrocarpus*, 1X

hence the common name Slipper Flower Plant. Colored floral bracts common to members of the Euphorbiaceae are absent in Pedilanthus. Fruit consists of a capsule that is about 2 cm. broad and is long exerted beyond the floral remnants. The capsule is long beaked and has a number of spinelike protrusions in the basal area. The brown seeds are nearly round in shape and measure 6 to 8 mm. in diameter.

DISTRIBUTION:

Candelilla is a plant of coastal plain and insular habitats. It grows in full sun or partial shade on deep, fertile, clay or loam soils. Elevational range is from 3 to 90 meters. Plants in common association are: **Larrea tridentata** (Creosote bush), **Pachycereus pringlei** (Cardon), **Jatropha sp.**, **Bursera sp.**, and **Fouquieria sp.** (Ocotillo).

In distribution, **Pedilanthus macrocorpus** is found only in Mexico in the mainland states of Colima and Sonora, on the Baja California Peninsula, and on some of the Mexican coastal islands. Magdalena Bay in Baja California is the type locality.

CULTURE:

Candelilla is very drought resistant and is hardy to temperatures as low as 17°F. Seedlings and young plants would, however, require protection from very low temperature. Bimonthly waterings during dry seasons, while not essential, are an aid in maintaining the plant in a turgid condition. This species does equally well on deep and on shallow rocky soils. Fertilization of poorer soils is beneficial to this plant.

PROPAGATION:

Pedilanthus can be propagated easily by using either seed or cutting material. Pretreatment of the seed is not required and germination is rapid during Spring months. Growth rate is slow at all stages of development. Seedlings can be started in flats or containers then planted out after one year's growth.

Faciated stem with emerging normal stems.

REMARKS:

Slipper Flower Plant draws considerable comment by visitors due to the shape of its flower and also the fasciated stem growths. Its growth form is not closely approximated by any other succulent plant in the New World.

REFERENCES:

Gentry, Howard S.—Rio Mayo Plants.

Goldman, E. A.—Biological Investigations in Mexico.

Jacobsen, H.—A Handbook of Succulent Plants.

Shreve, Forrest—Vegetation of the Sonoran Desert.

Standley, P. C.—Trees and Shrubs of Mexico.

COMPARATIVE TRANSPIRATION of Larrea tridentata SHRUBS on DRY and WET SITES

Myles C. Grabau* and Carey E. Vasey*

Since water is apparently the most critical factor in the lives of the creatures of the deserts, followed closely by and tied insensibly to temperature, it was thought that a study of **Larrea tridentata** transpiration during the month of July, when moisture is low and temperature is high, might answer some of the perplexing questions about the physiology of this most successful desert plant.

Concerning its success the following has been said: Jaeger (3) states that "Creosote bush is the most widespread, successful, and conspicuous xerophyte. . . Over wide areas in the Mojave Desert it occurs in such pure stands as to constitute true larrea plains." And according to Marshall (2), "The outstanding plant of the Sonoran and Chihuahuan deserts is the creosote bush (**Larrea tridentata**). . . "

Of its morphology Marshall (2) had the following to say: "The creosote bush has first of all a very deep tap root to go down to the water table in addition to widespread surface roots to take in water from the occasional rains."

"It has greatly reduced leaves, the largest not over 10 mm. long and 5 mm. wide. In addition each leaf is coated with a varnish produced by the plant to further prevent water loss. Under extreme drought conditions it even resorts to the final precaution of shedding its leaves and "hibernating" until water is again available."

The questions the authors endeavored to answer were:

1. Does **Larrea tridentata** transpire under the soil and temperature conditions to which it is exposed in late July on the Arizona desert near Tempe, Arizona? (i.e., afternoon air temperature of near 100°F. and above, and after a period of several months or more of no rainfall.)

2. At what rate does **Larrea tridentata** transpire under the conditions set down above except that the soil has become saturated (or nearly so) by a heavy summer rain?

In an attempt to arrive at the answers to these questions Mr. W. Hubert Earle, Director of the Desert Botanical Garden of Arizona, Tempe, Arizona, was contacted for permission to use plants located in the garden. His assistance and cooperation were beyond expectation and plants to be used were selected at that site.

Two **Larrea tridentata** plants were carefully chosen. One plant near a ditch had been thoroughly watered by an overflow from a reservoir. This specimen measured approximately ten feet in diameter at the perimeter and five feet six inches high in the center. The other plant, eight feet in diameter and five feet six inches high in the center, was located on a well drained slope approximately two hundred feet from the plant mentioned above and had had no water beyond natural rainfalls which were inadequate to initiate growth.

Examination of the two plants revealed the following contrasts:

The **Larrea** growing in the well-watered area was generously supplied with bright green, turgid leaves and was in bloom. The specimen growing on the dry slope showed signs of drought. Its leaves were much darker in color, were not flat or turgid; a condition characteristic of dried out plants of this species.

* Myles C. Grabau, Maryville, Mo. and Carey E. Vasey, Levittown, Pa., were attending the summer Desert Biology Institute, Arizona State University when they made this test.

M. C. Grabau and Carey E. Vasey conducting experiment on 'moist' *Larrea tridentata* using a plastic tent.

The date chosen for the experiment was July 26, 1962. During the course of the experiment no appreciable reduction in solar radiation was evident. Except for extremely thin alto-cirrus clouds, the sky remained clear throughout the experiment.

Dr. John P. Decker, plant physiologist of the Rocky Mountain Forest and Range Experiment Station, Tempe, Arizona was also contacted and through his splendid knowledge and cooperation the method of approach to the problem was outlined and equipment was acquired.

The procedure used was essentially the same as outlined by Decker **et al.** (1), the equipment used was loaned by the Rocky Mountain Forest and Range Experiment Station, Tempe, Arizona, and was set up under the supervision of Dr. John P. Decker. Briefly, it was as follows:

Each test plant was enclosed by a transparent tent that was ventilated at a known rate. The air temperature, entering and leaving the tent, was measured with a dry and wet bulb thermometer.

The plastic tent was frameless, bottomless, and was inflated over each plant by a blower driven by a gasoline engine. The tent was stabilized by three ropes tied to the top of the tent and anchored by stakes to the ground. Each tent was drawn in close to the bottom of the plant in order to prevent the inclusion of water vapor loss from soil in the measurement. The lower edges of the tent were anchored by sandbags and reinforced by dirt to make the enclosure air tight.

Ventilation rate of outflow of air was measured with a Flo-Rite indicating anamometer. The rate was stabilized at 1800 cu. ft. of air per minute.

Readings were taken at convenient intervals, four readings from each thermometer constituting a given set. A total of fourteen sets of readings were taken during the experiment. The raw data were treated as follows: Mean temperatures were computed for each set of four readings, and dewpoints were computed from these data with the aid of a U. S. Weather Bureau psychrometric calculator (circular slide rule).

Dewpoints were translated to absolute humidities, in terms of mg. per liter, according to standard steam tables. Outlet humidity minus inlet humidity, in mg. per liter, multiplied by ventilation rate, in kiloliters per minute, gave transpiration rate in gm. per minute. The authors are indebted to the Rocky Mountain Experiment Station for handling the calculations.

Results of the experiment are tabulated in Table I.

TABLE I

Transpiration Rates of **Larrea tridentata** Expressed in Grams Per Minute

July 26, 1962

Time of Reading	Dry Plant gms./min.	Green Plant gms./min.
A.M.		
11:26	2.85	43.61
11:33	3.74	45.75
11:42	14.77	44.32
P.M.		
12:03	12.82	51.04
12:12	9.97	45.67
12:30	9.61	43.34
12:38	14.06	44.18
1:08	13.94	48.06
1:15	15.97	44.50
3:10	11.42	45.86
3:15	6.05	47.54
3:22	7.56	39.99
3:28	15.79	43.85
3:34	9.41	49.39
TOTAL	147.96	637.10
AVERAGE	10.57	45.51

Summary and Conclusions

Measurements were made of the transpiration rate of two **Larrea tridentata** plants, one of which was on wet soil and consequently turgid; the other on dry soil and showing definite symptoms of drought. It was found that on the average for the time the measurements were made the wet plant transpired 45.51 gms./min. while the dry plant transpired 10.57 gms./min.

Although more work needs to be done to confirm these results, it would appear that **Larrea tridentata** is an important factor in soil-moisture depletion on the deserts where it is found, and that although it appears to be inactive it is still quite actively transpiring.

Bibliography

(1) Decker, John P., Gaylor, William G., and Cole, Frank D. 1962. Measuring Transpiration of Undisturbed Tamarisk Shrubs. Plant Physiology, Vol. 37, No. 3, pp. 393-397.

(2) Marshall, W. Taylor. Introduction to Desert Plants. Science Bulletin No. 3. Desert Botanical Garden of Arizona.

(3) Jaeger, Edmond G. 1941. Desert Wild Flowers. Stanford University Press, Stanford, California, p. 135.

ACTIVITIES FOR DECEMBER

3rd, 8 P.M.—CACTOMANIACS. Members will show 10-15 of their interesting 1963 135mm slides.
4th, 3 P.M.—CLASS, Culture of Desert Trees and Shrubs.
5th, 3 P.M.—LECTURE, Arizona Scenics.
11th, 9:30 A.M.—CLASS, All day Desert Field Trip.
12th, 3 P.M.—LECTURE, Succulents other than Cacti.
19th, 3 P.M.—LECTURE, Collecting plants in Mexico.
26th, 3 P.M.—LECTURE, Arizona Cacti in Bloom.

SAGUARO LAND BULLETIN

DESERT BOTANICAL GARDEN of ARIZONA

Vol. XVII December, 1963 No. 10

REG MANNING

SAGUAROLAND BULLETIN

Published and owned by the Arizona Cactus and Native Flora Society, sponsors of the Desert Botanical Garden of Arizona. P. O. Box 5415, Phoenix 10. Saguaroland Bulletin attempts to promote the Garden and to provide information on the desert plants and their culture. Subscription $5.00 per year, the subscription including active membership in the Society and the Desert Botanical Garden. Issued 10 times a year.

W. HUBERT EARLE, Editor

Volume XVII | December, 1963 | No. 10

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To all the members and friends of the Garden

From the Official Board, Advisory Board and the Garden Staff

Caesalpinia palmeri — Family Leguminosae

By John Weber, Horticulturist

DESCRIPTION:

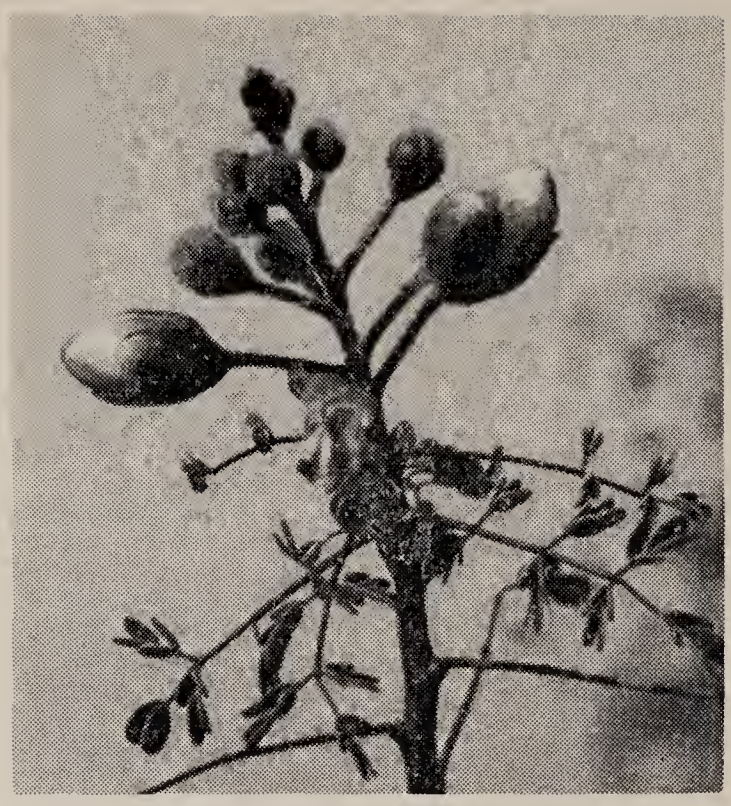
CAESALPINIA PALMERI is a slender unarmed shrub or tree. In size it ranges one to two meters and occasionally up to 4.5 meters high. Leaves are blue-green in color and glabrous. These are divided into three to five paired leaflets measuring 4 to 15 mm. long and 2 to 5 mm. wide. Flowers are yellow and borne on short racemes. Calyx lobes are entire and densely pubescent. Pedicels are jointed above the middle and bear no glands. The bivalvate fruite is thin about 5.5 cm. long and 1.5 cm. wide. The pod is purple tinged and covered with a fine pubescence. Contained within the pod are four or five rounded thin seed, 3 to 7 mm. in diameter.

DISTRIBUTION:

CAESALPINIA PALMERI grows at elevations ranging from tidewater to 350 meters. At the lower levels of distribution on tidal flats and coastal plains, the plant takes the form of a low spreading bush. At higher elevations on arid mesas and foothills it grows into a slender upright tree. Soils vary from deep loam or clay to shallow, rocky, well-drained soils.

This species is found in the Mexican west coast states of Sinaloa and Sonora as well as in the Baja California Peninsula.

Caesalpinia palmeri
3 years old, 8′ tall



Caesalpinia palmeri
flower buds 1X

Caesalpinia palmeri
flowers and leaves 1/3X

UTILIZATION:

Palmer's Caesalpinia has no particular value as a flowering shrub as the flowers are quite small. Being a large open shrub, it may be used as a basic foundation plant against blank walls or at accent points such as building corners. As an unarmed plant, it can be employed for a light screening or divider plant adjacent to patios and service areas. The miniature blue-green leaflets and elfin yellow flowers are suitable for making temporary floral arrangements and centerpieces.

CULTURE:

CAESALPINIA PALMERI growing on the grounds of the Desert Botanical Garden has withstood temperatures of 17°F. without damage. While being drought resistant to some extent, it soon defoliates when subjected to stress from prolonged absence of soil moisture. On well-drained soils, the plant should receive weekly irrigations during dry seasons. Rapid growth results under cultivation and the plant may require support temporarily. Selective pruning can limit the extent of growth as desired.

PROPAGATION:

Seed pretreatment is necessary with this species as it is with others of the genus Caesalpinia. This may be achieved by scarification, hot water, or acid treatment. Under optimum conditions, germination and growth rate are very rapid. A flowering shrub, two meters high, can be produced with a growth period of two years. Seedlings are best started in small containers and installed after one years growth. Cuttings of half-hard or hardwood will root out easily if taken during the spring months.

REMARKS:

This plant will appeal to those gardiners who search for plants that are rare or unknown in cultivation.

REFERENCES:

Gentry, H. S., Rio Mayo Plants
Standley, P. C., Trees and Shrubs of Mexico.

ERIOGONUM DEFLEXUM

SKELETON-WEED

Polygonaceae

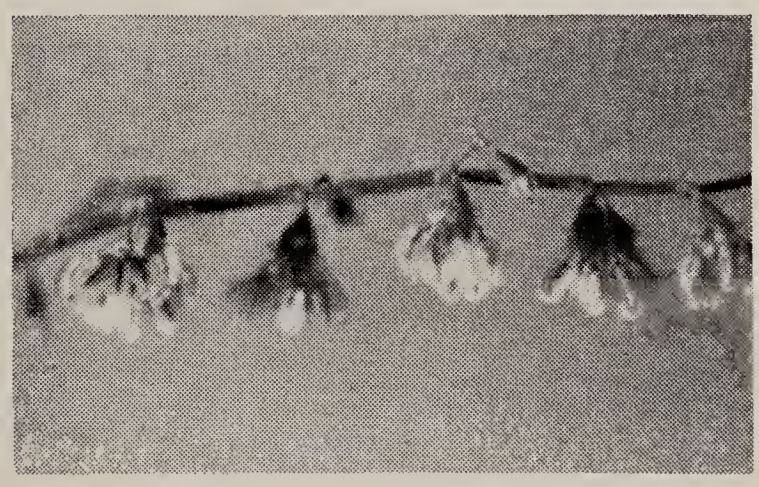
BUCKWHEAT Family

Plant of *Eriogonum deflexum* 10″ tall and 15″ wide in flower and fruit. Note the rosette of dried basal leaves.

A low, short, annual inconspicuous plant that is quite common along our roadsides through the summer months but as cool weather of our fall approaches, the hundreds of small 3/16″ long, white pendant blossoms take on a light pink color changing to a darker pink. This is followed by the skeleton-like stems changing to a red causing the shoulders of our highways to appear red with borders of these plants.

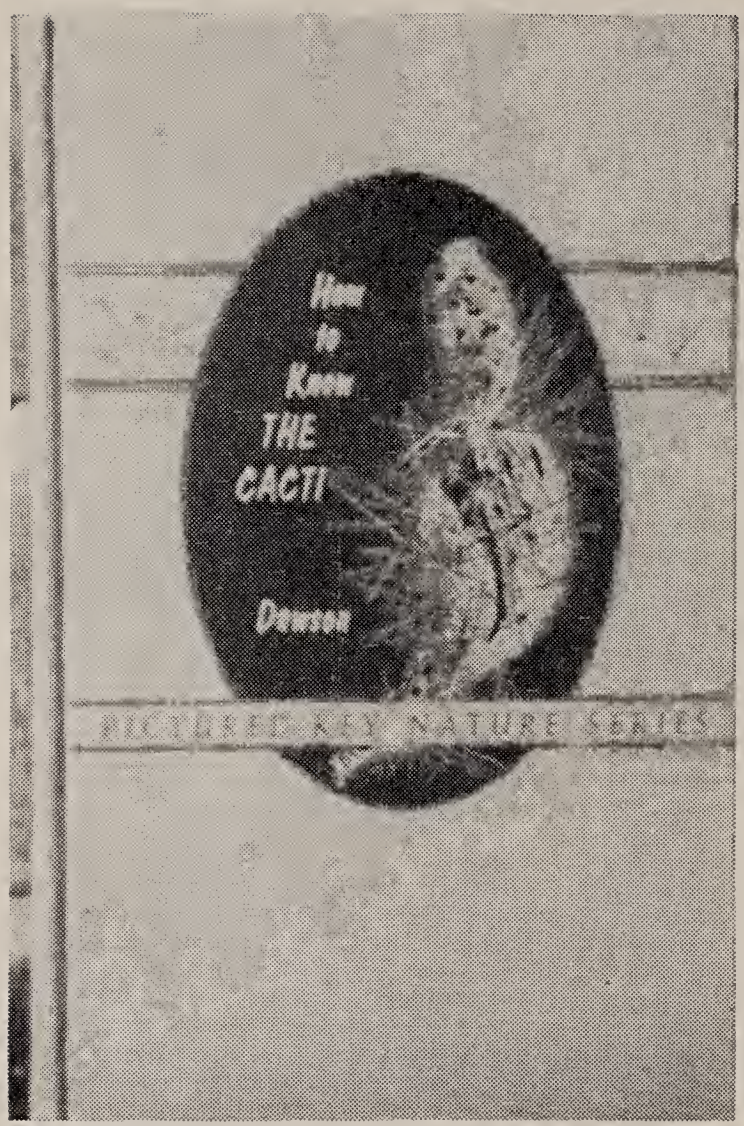
Eriogonum deflexum (L. — 'turned-down') is a single stemmed annual plant arising out of a basal, rosette of leaves with many branches branching off the single or sometimes double stems. The plant is 1′-2′ tall with a 1′-2′ flat spreading top. Along the branching stems hang myriads of small flowers. It grows profusely during moist or dry periods in the low semi-deserts of western Arizona, southern Utah, eastern California, northern Sonora and Baja California.

Skeleton-weed provides pollen and nectar for bees, a light browse for cattle and sheep and many seeds for birds. It makes an attractive addition to desert gardens. Seeds are not always available in seed stores but you can harvest them in late November or through December.



Eriogonum deflexum
flowers and seed pods 2X

TWO NEW BOOKS



HOW TO KNOW THE CACTI

E. Yale Dawson

168 p. 181 photos & line drawings

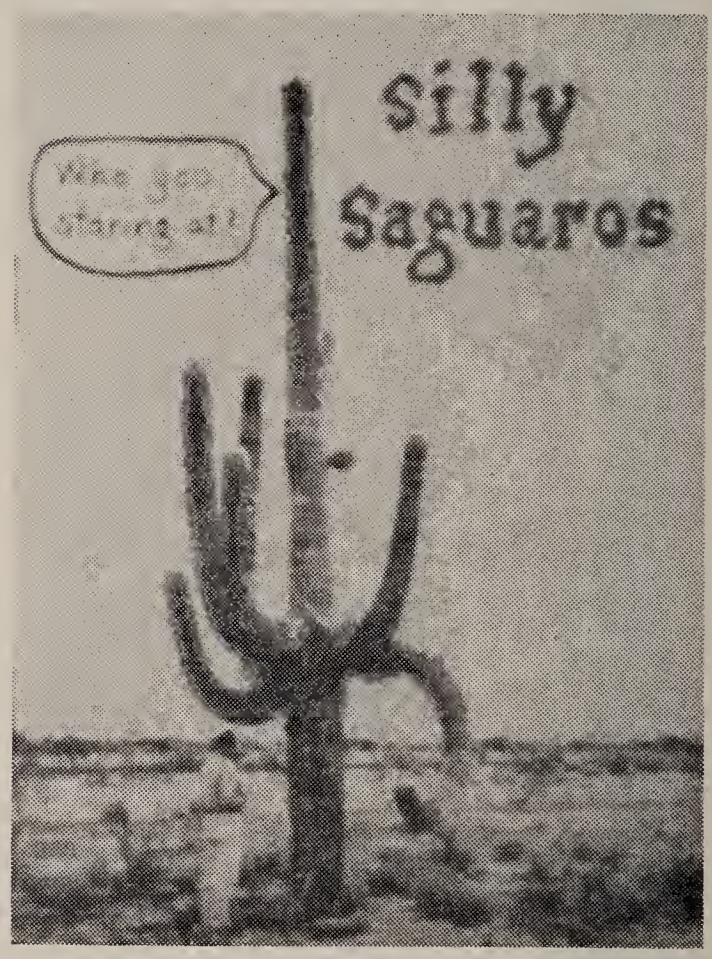
Cloth — $3.00

The Wm. C. Brown Publishing Co., Dubuque, Iowa, has published 24 books in their Pictured-Key Nature Series over the past 17 years. These include subjects that range from insects, trees, flowers, liverworts, mammals, etc. and now a Pictured-Key book on Cacti is available.

The author, Dr. E. Yale Dawson, has been recently appointed as Director of the San Diego Natural History Museum. He is a world authority on marine algae but has had an interest in cacti since early boyhood.

Dr. Dawson has gathered into this book the cactus of the USA and some of the prominent introduced species. Many field photographs and those from text books will help a person identify their plants along with the understandable keys.

Excellent information is given on geographic distribution, morphology and the study of cacti. The combined pictured-key glossary and index is unusual and quite helpful. The book is devoid of 'fluff' but gives you condensed information you need to identify the commoner plants found in North American collections.



SILLY SAGUAROS

Frank Redding, Phoenix

60 p. paper — $1.60

A pocket-size book filled with photos of Saguaros in grotesque positions, each with an amusing exclamation that will delight you for half an hour. If you like the desert you will enjoy the remarks and pass the book on to other folks for a bit of relaxation.

Both books are available at our BOOK STORE.
Above prices include mailing.

ARIZONA POINT OF INTEREST

SAN FRANCISCO MOUNTAINS are located behind the town of Flagstaff in north-central Arizona. They are a group of volcanic craters and peaks. The highest, Humphrey Peak—12,655 (highest point in Arizona); Agassiz—12,300'; Fremont—11,940' are the main peaks. A good road winds up thru the mountains which are famed for their fall colored Aspen trees and winter sports area—The Snow Bowl.

GERMINATION STUDIES OF CERCIDIUM FLORIDUM — A DESERT PERENNIAL

By HAL A. CLUFF
Mesa, Arizona

Introduction

The characteristic openness of desert vegetation affords ample room for the establishment of new individuals of the perennial species, a marked contrast to what is true of forests or grasslands. The number of germinations that take place during any rainy season in the desert is very great as compared with the number of establishments that result from them. The low water-content of the soil, which is by far the most important factor in preventing establishment, most frequently operates to kill seedlings soon after the close of the rainy period in which they germinated, or, in a smaller number of cases, becomes opreative after several years of successful growth have brought the root systems into regions of the soil that are already being drained by perennials that have been established for a long time. The rainy seasons of Southwestern deserts vary from year to year in the amount and duration of rainfall. These fluctuations have much to do with the persistance or death of seedlings (Shreve 1910).

Working with the giant cactus, Shreve recognized that in general, schlerophyllous shrubs have numerous germinations with high mortality during the first growing season. Those which survive the first dry period after germination are most generally killed only by low and prolonged depressions in the annual curve of soil moisture.

Perennial plants of the Arizona desert, (with particular reference to those of Maricopa County) are usually regenerated by seeds. Many of the tree-form perennials in this area belong to the family Leguminosae. Such plants typically produce seeds with thick water impermeable seed coats. This type of coat may function as a "survival mechanism" in that it prevents all the seedlings from germinating during one season, so that a reserve of non-germinated seeds are held in a "depressed state", having the potential to regenerate the species at a later time.

The impermeability of the seed coats of certain desert seeds was examined by Barton (1936). She indicated that morphological differences in the structures surrounding the embryos account for variations in the germination responses of desert seeds. She further stated that it has long been known that certain seeds, especially those of the family Leguminosae, possess coats which prevent the absorption of water necessary for germination.

Field studies of seedling survival in Palo Verde were carried out by Shreve (1911) on plots near Tucson. He was principally interested in the mortality rate of the Palo Verde from germination to maturity. Since his work was essentially a field study, a complimentary laboratory study of the same problem would seem very desirable.

The present paper represents such an attempt, to examine the influence of certain environmental factors on **Cercidium floridum** (the Blue Palo verde) seed germination under controlled laboratory conditions.

The Plant. Cercidium floridum, a tree-form desert perennial (native to Arizona) depends exclusively on seed germination for its regeneration and survival. This species is commonly called the "Blue Palo verde" and is character-

Cercidium floridum 15′ tall and 25′ wide tree. This tree plus *Cercidium microphylum* have been designated as our State Tree—
The Palo Verde Tree.

ized by Kerney and Peebles (1960) as follows.

Large shrubs or small trees, attaining a height of about 8m.; young bark smooth, bluish-green; rachis of the pinnae short, terete; flowers showy, yellow, in corymbose fascicles; pods more or less torulose.

Methods and Materials

Blue Palo verde seeds were obtained from the curators of the Desert Botanical Gardens, near Tempe, Arizona. The seeds were from this years crop (1962). They were tested for gross viability, by floating them in water. Viable seeds were considered to be those which sank while those which floated were considered to be non-viable. A total of 320 viable seeds chosen in this manner were then sorted into 16 lots consisting of 20 seeds per lot.

Treatments to simulate certain environmental factors effecting seed germination were:

A. Non-scarification of the seed coats.

B. Scarification of the seed coat by clipping a hole in the end of the seed which was opposite the micropyle.

C. Freezing of some seeds for 10 days at -10° C.

D. Leaving other seeds at normal room temperature.

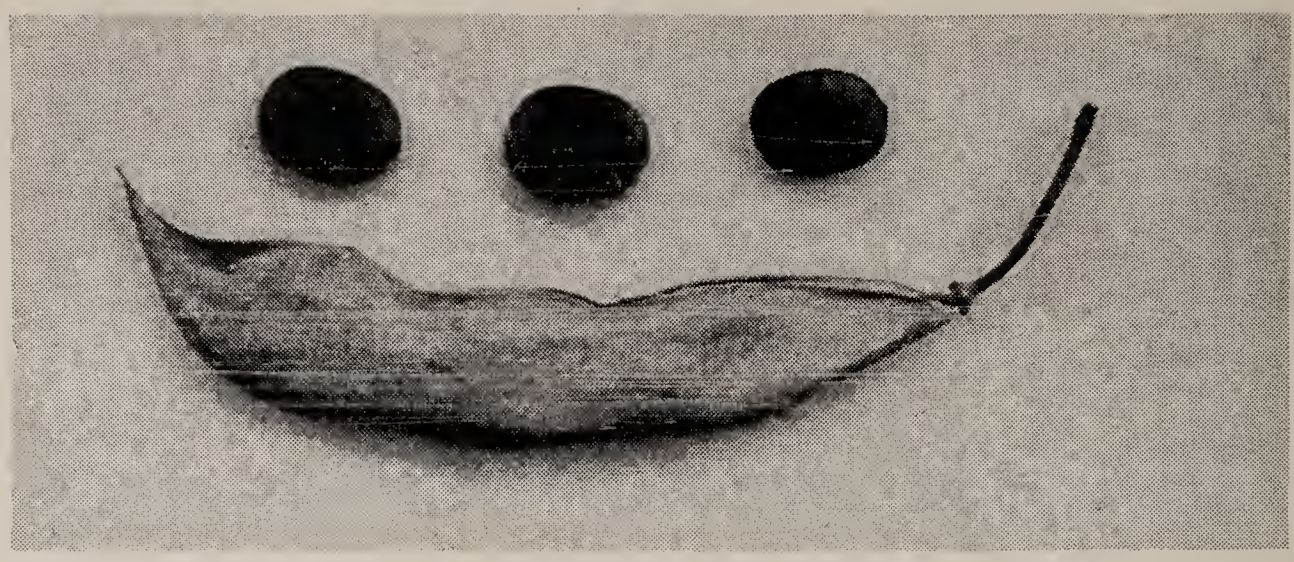
E. Some seeds were germinated in full light (approximately 240 f.c. on a Weston meter).

F. Other seeds were kept in a dark box in complete absence of light.

G. A portion of the seeds were germinated using distilled water.

H. Another lot of seeds were germinated in an extract obtained from **Encelia farinosa** (which is germination inhibitor for some plants).

A different treament was applied to each seed lot, with the treatments being



Pod and seed of *Cercidium floridum* 1¼X

arranged so that each treament would occur together with each other treatment as scheduled below:

1. non-scarified, non-frozen seeds over water in the dark.
2. non-scarified, non-frozen seeds over water in the light.
3. scarified, non-frozen seeds over water in the dark.
4. scarified, non-frozen seeds over water in the light.
5. non-scarified, frozen seeds over water in the dark.
6. non-scarified, frozen seeds over water in the light.
7. scarified, frozen seeds over water in the dark.
8. scarified, frozen seeds over water in the light.
9. non-scarified, non-frozen seeds over extract in the dark.
10. non-scarified, non-frozen seeds over extract in the light.
11. scarified, non-frozen seeds over extract in the dark.
12. scarified, non-frozen seeds over extract in the light.
13. non-scarified, frozen seeds over extract in the dark.
14. non-scarified, frozen seeds over extract in the light.
15. scarified, frozen seeds over extract in the dark.
16. scarified, frozen seeds over extract in the light.

This scheme of arrangement gave eight replications of each treatment and allowed for comparisons between all treatments applied to the seeds.

Germination chambers consisted of petri dishes with a layer of absorbant cotton in the bottom, to prevent complete submergence of seed and yet facilitate a maximum of liquid-seed coat contact. After the cotton was in place, all germination chambers were sterilized for 30 minutes to 110° C. in a steam autoclave.

Seeds were then transferred into the chambers in as sterile a manner as possible. Frozen seeds were allowed to thaw for about an hour before being treated. Seeds were scarified (if this treatment was applicable) then passed quickly through an alcohol bath, a water rinse, and pressed into the cotton layer with forceps.

Once the seed lots were all placed (20 seeds per petri dish), there remained only to apply 50 ml. of germination solution per plate, (this consisted of either distilled water or **Encelia** extract).

Source of Extract. The **Encelia** extract was obtained from the grey desert shrub **Encelia farinosa** (Brittle Bush) Leaves of the plant were harvested, washed in water to remove debris, and

then weighed. A total of 122 gms. of leaves were placed in a pyrex flask to which 500 ml. of ether was added. The flask and contents were then heated over a hot plate and the mixture stirred occasionally. After 30 minutes the extract was filtered through a Bucher funnel using a suction flask. The filterate appeared to contain two distinctly different solutions. One substance was the chlorophyll which had gone into solution in the ether, while the second substance was more dense and tended to settle to the bottom of the blask. The second substance was yellowish-black in appearance and somewhat colloidal in nature. It was not at all miscible with the ether solution and when it dripped from the funnel into the ether-chlorophyll solution, it immediately rounded into a ball and dropped to the bottom of the flask where it flattened out, but did not dissolve.

The immiscibility of the ether and yellow extract made their separation relatively easy, (a separatory funnel proved to be very satisfactory for this purpose). After separation it was noted that 250 ml. of the chlorophyll-ether extract and 17 ml. of the yellowish extract had been obtained. The yellowish extract was thought to contain the anti-germination substance referred to by Bonner (1950).

The extract was prepared for use by diluting 1 ml. of the yellowish substance with 99 ml. of distilled water. This method worked quite satisfactorily because the yellowish substance was found to be completely soluable in water. Each petri dish was then flooded with either 50 ml. of water or 50 ml. of extract solution, according to the treatment desired.

Germinating seeds were removed from the petri dishes by using forceps and as sterile a technique as possible. According to Blake (1935) the standard of germination is arbitrarily fixed. Most often it has been regarded as the projection of both root and plumule beyond the seed coat or appearance of the first leaf above ground, a standard established by Zinn (1920. However, the author of the present experiment took the liberty of considering his seeds to be germinated when the seed coat had been ruptured by the radicle and the radicle could be plainly seen projecting from this opening. An extension to the original experiment was made by planting the germinated seeds in pots in the greenhouse to see which seeds would survive to the seedling stage. It was felt that even if the extract did not inhibit germination it might possibly affect seedling survival.

Results and Discussion

The results obtained in this experiment were not entirely what had been expected prior to running the tests. In a few instances the results were about the same as had been predicted.

The overall germination curve (refer to graph) which plots the total number of seeds germinating per day against the number of days since initiation of the experiment, was quite interesting. It showed that irregardless of treatment, the maximum rate of seed germination occurred the second and third day. After the fourth day, germination abruptly dropped. Two aspects of this data were especially outstanding: 1. Many seeds had actually germinated 24 hours after being put into the chambers. 2. Germination ended the sixth day as abruptly as it had started the first day.

In all, a total of 320 seeds were used in this experiment. Of this number, a total of 135 seeds germinated, giving an overallgermination rate of 42%. Some 58% failed to germinate at all.

Number of Seeds Germinating per Treatment

GERMINATION RECORD OF CIRCIDIUM FLORIDOM

Treatments	Days Since Planting	1	2	3	4	5	6.....30	
Non-scarified, non-frozen, water, dark		1	0	0	0	0	0.....0	1
Non-scarified, non-frozen, water, light		2	0	0	0	0	0.....0	2
Scarified, non-frozen, water, dark		1	9	4	0	0	1.....0	15
Scarified, non-frozen, water, light		0	11	4	1	0	0.....0	16
Non-scarified, frozen, water, dark		1	0	1	0	0	0.....0	2
Non-scarified, frozen, water, light		0	0	0	0	0	0.....0	0
Scarified, frozen, water, dark		0	7	6	3	0	0.....0	16
Scarified, frozen, water, light		1	12	4	0	0	0.....0	17
Non-scarified, non-frozen, extract, dark		2	0	0	0	0	0.....0	2
Non-scarified, non-frozen, extract, light		2	0	0	0	0	0.....0	2
Scarified, non-frozen ,extract, dark		0	7	6	0	0	0.....0	2
Scarified, non-frozen, extract, light		2	13	2	1	0	1.....0	19
Non-scarified, frozen, extract, dark		0	2	0	0	0	0.....0	2
Non-scarified, frozen, extract, light		0	1	0	0	0	0.....0	1
Scarified, frozen, extract, dark		0	6	7	1	0	0.....0	14
Scarified, frozen, extract, light		0	9	4	0	0	0.....0	13
Number of Seeds Germinating per Day		12	77	38	6	0	2.....0	135

(To be concluded in January issue)

ACTIVITIES FOR DECEMBER

3rd	8:00 P.M	CACTOMANIACS—Members will show 10-15 of their interesting 1963 slides.
4th	3:00 P.M.	CLASS—Culture of Desert Tree and Shrubs.
5th	3:00 P.M.	LECTURE—Arizona Scenics
11th	9:30 A.M.	CLASS—All-day Desert Field Trip.
12th	3:00 P.M.	LECTURE—Succulent Plants other than Cacti.
19th	3:00 P.M.	LECTURE—Collecting plants in Mexico.
26th	3:00 P.M.	LECTURE—Arizona cacti in bloom.

ACTIVITIES FOR JANUARY

2nd	3:00 P.M.	LECTURE—Arizona Wildflowers
5th	3 & 4 P.M.	LECTURE—Arizona Wildflowers
7th	8:00 P.M.	CACTOMANIACS.
8th	3:00 P.M.	CLASS—Deserts how formed and their plants.
9th	3:00 P.M.	LECTURE—Arizona Trees & Shrubs.
12th	3 & 4 P.M.	LECTURE—Arizona Trees & Shrubs.
15th	3:00 P.M.	CLASS—Desert Succulent Plants.
16th	3:00 P.M.	LECTURE—Arizona Birds & Animals.
19th	8:30 A.M.	CACTOMANIACS Field Trip.
19th,	3 & 4 P.M	LECTURE—Arizona Birds & Animals.
22nd	3:00 P.M.	CLASS—Culture of Succulent plants.
23rd	3:00 P.M.	LECTURE—Arizona Scenics.
26th	3:00 P.M.	LECTURE—Arizona Scenics.
29th	3:00 P.M.	CLASS—Identification desert trees
30th	3:00 P.M.	LECTURE—Succulents other than Cacti.

APRIL

1	3 P.M.	Class - Culture of Trees & Shrubs
2	3 P.M.	Lecture - Succulents Other Than Cacti
5	3&4 P.M.	Lectures - Arizona Cacti in Bloom
7	8 P.M.	Cactomaniacs
8	9:30 A.M.	Class - All day desert field trip
9	3 P.M.	Lecture - Arizona Cacti in Bloom
12	3&4 P.M.	Lectures - Arizona Wildflowers
16	3 P.M.	Lecture - Arizona Wildflowers
19	3&4 P.M.	Lectures - Arizona Trees & Shrubs
23	3 P.M.	Lecture - Arizona Trees & Shrubs
26	3&4 P.M.	Lectures - Arizona Birds & Animals
30	3 P.M.	Lecture - Arizona Birds & Animals

MAY

5	8 P.M.	Cactomaniacs

OCTOBER

5	8 P.M.	Cactomaniacs

NOVEMBER

2	8 P.M.	Cactomaniacs
4	3 P.M.	Class - Deserts: How Formed & Their Plants
5	3 P.M.	Lecture - Arizona Cacti
8	3&4 P.M.	Lectures - Arizona Cacti
11	3 P.M.	Class - Desert Succulent Plants
12	3 P.M.	Lecture - Arizona Wildflowers
15	3&4 P.M.	Lectures - Arizona Wildflowers
18	3 P.M.	Class - Culture of Succulent Plants
19	3 P.M.	Lecture - Arizona Trees & Shrubs
22	3 P.M.	Lecture - Arizona Trees & Shrubs
25	3 P.M.	Class - Identification of Trees & Shrubs
26	3 P.M.	Lecture - Arizona Birds & Animals
29	3 P.M.	Lecture - Arizona Birds & Animals

DECEMBER

2	3 P.M.	Class - Culture of Trees & Shrubs
3	3 P.M.	Lecture - Arizona Scenics
6	3&4 P.M.	Lectures - Arizona Scenics
9	9:30 A.M.	Class - All day desert field trip
10	3 P.M.	Lecture - Succulents Other Than Cacti
13	3&4 P.M.	Lectures - Succulents Other Than Cacti
17	3 P.M.	Lecture - Collecting Plants in Mexico
20	3&4 P.M.	Lectures - Collecting Plants in Mexico
24	3 P.M.	Lecture - Arizona Cacti in Bloom
27	3&4 P.M.	Lectures - Arizona Cacti in Bloom
31	3 P.M.	Lecture - Arizona Wildflowers

The Desert Botanical Garden is a Non-profit Incorporated Educational Society for the Study of Desert Plants.

Your support and membership are tax-deductible.

DESERT BOTANICAL GARDEN OF ARIZONA
in Papago Park
6400 E. McDowell, Phoenix, Arizona

GARDEN is open daily 9:00 A.M. - 5:00 P.M. including weekends and holidays.

Free illustrated LECTURES are given each Thursday at 3:00 P.M. and Sundays at 3:00 and 4:00 P.M.

CLASSES in a "Better understanding and the use of desert plants for landscaping use" are held each 6 weeks during the fall, winter, and spring on Wednesdays at 3:00-4:00 P.M. There is no charge for enrollment.

1964 CALENDER OF ACTIVITIES is as follows: -

JANUARY

2	3 P.M.	Lecture - Arizona Wildflowers
5	3&4 P.M.	Lectures - Arizona Wildflowers
7	8 P.M.	Cactomaniacs
8	3 P.M.	Class - Deserts: How Formed & Their Plants
9	3 P.M.	Lecture - Arizona Trees & Shrubs
12	3&4 P.M.	Lectures - Arizona Trees & Shrubs
15	3 P.M.	Class - Desert Succulent Plants
16	3 P.M.	Lecture - Arizona Birds & Animals
19	3&4 P.M.	Lectures - Arizona Birds & Animals
22	3 P.M.	Class - Culture of Desert Succulent Plants
23	3 P.M.	Lecture - Arizona Scenics.
26	3&4 P.M.	Lectures - Arizona Scenics
29	3 P.M.	Class - Identification of Arizona Trees & Shrubs
30	3 P.M.	Lecture - Succulent Plants Other Than Cacti

FEBRUARY

2	3&4 P.M.	Lectures - Arizona Cacti in Bloom
4	8 P.M.	Cactomaniacs
5	3 P.M.	Culture of Desert Trees & Shrubs
6	3 P.M.	Lecture - Collecting Plants in Mexico
9	3&4 P.M.	Lectures - Arizona Wildflowers
12	9:30A.M.	Class - All day desert field trip
13	3 P.M.	Lecture - Arizona Birds & Animals
16	3&4 P.M.	Lectures - Arizona Birds & Animals
23-March 1	9 A.M.-5 P.M.	17th Annual Cactus Show

MARCH

1	9 A.M.-5 P.M.	Last day of 17th Annual Cactus Show
3	8 P.M.	Cactomaniacs
4	3 P.M.	Class - Deserts: How Formed & Their Plants
5	3 P.M.	Lecture - Arizona Wildflowers
8	3&4 P.M.	Lectures - Arizona Cacti in Bloom
11	3 P.M.	Class - Desert Succulent Plants
12	3 P.M.	Lecture - Arizona Trees & Shrubs
15	3&4 P.M.	Lectures - Arizona Wildflowers
18	3 P.M.	Class - Culture of Desert Succulent Plants
19	3 P.M.	Lecture - Arizona Birds & Animals
22	3&4 P.M.	Lectures - Arizona Birds & Animals
25	3 P.M.	Class - Identification of Arizona Trees & Shrubs
26	3 P.M.	Lecture - Arizona Scenics
29	3&4 P.M.	Lectures - Collecting Plants in Mexico